COMMODORE
64/128K

ADVANCED

THE MUSIC SYSTEM

USER MANUAL

firebird

AMS DEVELOPMENT TEAM

Back in April 1983 Phil Black at Sheffield University finished work on a program for the Acorn BBC/B computer called the Music Editor. The program was the first music screen editor to be developed for the machine. It allowed music to be written directly onto staves. Other innovations included the defining of sound envelopes within the program, three voices, six different tempos and the ability to write in any key.
This program was launched commercially by SYSTEM, the Sheffield based software house. The same month Black joined SYSTEM as a senior programmer.

The requirement for a program that would ease the difficult process of creating and editing envelopes was met by Geoffrey Ellis. The program was marketed by SYSTEM in August 1983 under the name of The Envelope Generator.

In October 1983 Adrian Boot from ISLAND LOGIC made contact with SYSTEM to co-develop a project which would create a fully integrated music package. The specification would include an Editor, Envelope generator (now known as The Synthesiser) and Keyboards. The package was to be written entirely in machine code to incorporate a four-voice Editor with many facilities, including automatic transposition, and animation of musical notes as they played.

By January 1984 an enhanced version of the Editor had been fully specified. The over-all specification of the package was revised to include the Linker and Printer modules. Preliminary coding using System's A.D.E. (Assembler,Debugger,Editor) began to establish the feasibility of such a project.

In the same month The Music System hit vinyl! SYSTEM's Envelope Generator was used on an album by Jamaica's leading reggae group Black Uhuru (courtesy of Island Logic's sister company, Island Records). The resulting album, Anthem was released the following July. These early trials at Island's Fallout Shelter Studio provided many ideas for the specification.

February 1984 saw the start of intensive programming both at SYSTEM and ISLAND LOGIC. The Music System Development team was born. Design work on the 'front end' of TMS was underway. An integrated 'user interface' with pop-up/icon graphics was defined and

implemented. A Control program was developed to handle each of the separate modules and provided a fully integrated package. In October 1984 The Music System was launched for the BBC/B micro.

By December 1984 The Music System development team had specified an improved version of TMS for the Commodore 64 micro. It included a complete new module, MIDI, which would allow external keyboard/synthesisers to be used within TMS. All the modules were redesigned to take advantage of the Commodore's superior sound hardware and additional memory.

In November 1984 Nicky Johns joined the ISLAND LOGIC end of the development team to coordinate each of the modules and to integrate them under a common filing system and Control Screen. A development environment for the new system which effectively used The BBC/B linked to a Commodore 64 was devised. This environment enabled the team to write this highly complex system.

Most of the work on the pop-up/icon graphics was completed in early February. Prototypes of the EDITOR and MIDI were being tested, and a text Editor was added to the PRINTER module allowing the user to enter and print Lyrics along with music files.

Between March and August 1985 intensive coding, testing and re-coding culminated in the completion of this new enhanced version of TMS. During this time SYSTEM completed work on a Simplified version of TMS for release on tape. This 'simplified' version includes the more important facilities of the Editor, Keyboard and Synthesiser modules, and provides an easy upgrade route to the advanced version. The TMS development team is currently working on improvements and new versions for other 8-bit machines as well as the new generation of computer hardware. The work continues.

Philip Black	(SYSTEM)	SOUND/VMW/ ADVANCED EDITOR TMS KEYBOARD/ EDITOR/SYSTEM DESIGN
Adrian Boot	(ISLAND LOGIC)	CONCEPT/SYSTEM DESIGN/USER MANUAL
David Ellis	(SYSTEM)	CONCEPT/SYSTEM DESIGN/USER MANUAL
Nicky Johns	(ISLAND LOGIC)	FILING/ INTEGRATION/DESIGN/ UTILITIES
Geoffrey Ellis	(SYSTEM)	DESIGN/ SYNTHESISER
Ewan Hayward	(SYSTEM)	ADVANCED LINKER
JOEY	(ISLAND LOGIC)	ADVANCED MIDI
Ching Man Wong	(ISLAND LOGIC)	COMMAND LINE/ KEYBOARD/GRAPHICS
Steve McGarry	(ISLAND LOGIC)	ADVANCED PRINTER
Shaun McGarry	(ISLAND LOGIC)	DEVELOPMENT SUPPORT/PRINTER

Additional design/help/support/encouragement from:

Brian Jones (ISLAND LOGIC)
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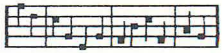
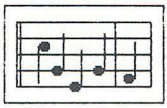
INTRODUCTION



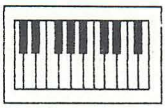
The Music System TMS is a comprehensive microcomputer-based music program for creating, editing, playing and printing music. The system allows easy input and storage of music which can then be played back through the Commodore 64 internal sound system, or through an external MIDI keyboard/synthesiser. Music can be printed out in proper musical notation together with lyrics.

The music is entered in various ways: through an extremely versatile EDITOR in written music format (note at a time). Via an on-screen piano KEYBOARD emulator, or via an externally connected MIDI keyboard. Each of these three input modes can create music files compatible with all other modules. The LINKER can connect these music files together to form much larger compositions. An understanding of the power as well as the limitations of TMS can be gained through experience with the EDITOR module. This module provides a central reference for the rest of the system, its highly flexible step by step music input producing very accurate results.

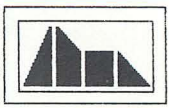
The types of sound that can be generated are almost unlimited due to the flexibility of the SYNTHESISER module. This allows you to create the shapes of the sounds simply and quickly. The sound shapes (ENVELOPES) are incorporated into the music using the EDITOR, KEYBOARD or MIDI modules, to give you amazing versatility over your compositions.



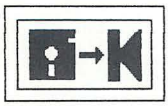
Editor



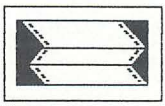
Keyboard



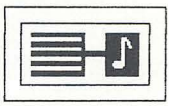
Synthesiser



Linker



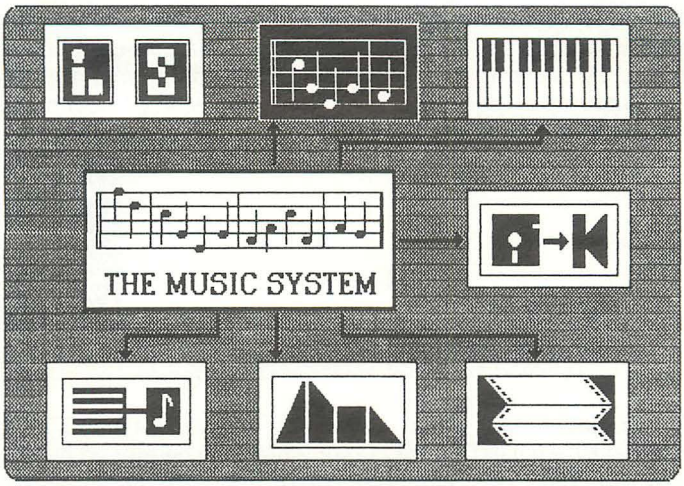
Printer



Midi

The six modules are directly accessible from the CONTROL SCREEN. Each module is identifiable by its own symbol or icon. When applicable data files are preserved when moving from module to module.

Moving around the MUSIC SYSTEM



TMS CONTROL SCREEN - EDITOR ICON SELECTED.

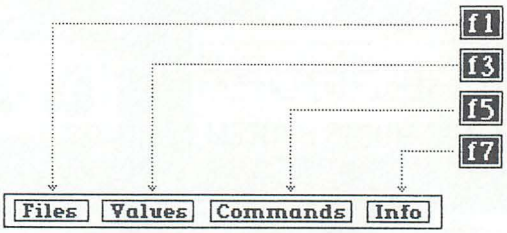
TMS is loaded from disk via the Commodore 1541 disk drive after typing **LOAD"TMS",8,1** and pressing **RETURN**. The Commodore 64 also allows you to enter **LOAD"*",8,1 (RETURN)**. After the Island Logic/System Copyright screen has appeared the main TMS program will load automatically. The loading will stop at the CONTROL SCREEN waiting for you to select a module. When moving from one module to the next, you must always pass through this creen. The highlighted icon is the one which may be run. Press **SPACE** or **SHIFT SPACE** to select the next icon. Keep pressing to get back to the original. Once selected the required module can be run by pressing **RETURN**. Make sure that the TMS system disk is in your disk drive before trying to load a module, otherwise an error message pop-up will appear.

In general **SPACE** is used throughout the system to move a highlight or select an operation.

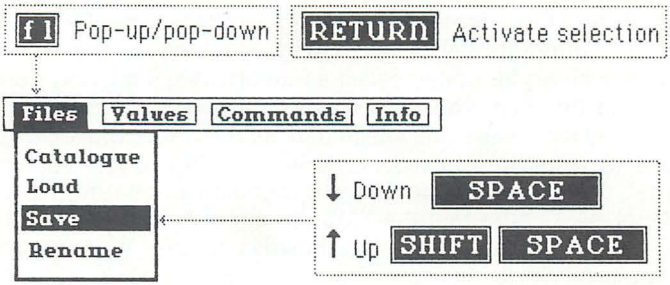
When in the module return to the CONTROL screen by pressing function key **F5** to activate the command line pop-up. Use **SPACE** to move the highlight bar over the **EXIT** command (eg. *EXIT KEYBOARD)* and press **RETURN**. A short cut back to the CONTROL SCREEN can be achieved via the **COM CLR/HOME** key pair. The **COM** key or **Commodore** key is at the bottom left of the keyboard. Make sure the TMS system disk is in the disk drive before leaving a module.

The command line

In each of the modules the command line provides easy access to the available functions of TMS. Any command line pop-up menu can be activated by pressing one of the four commodore function keys, and de-activated by pressing the same function key. Try selecting each of the command line pop-ups.

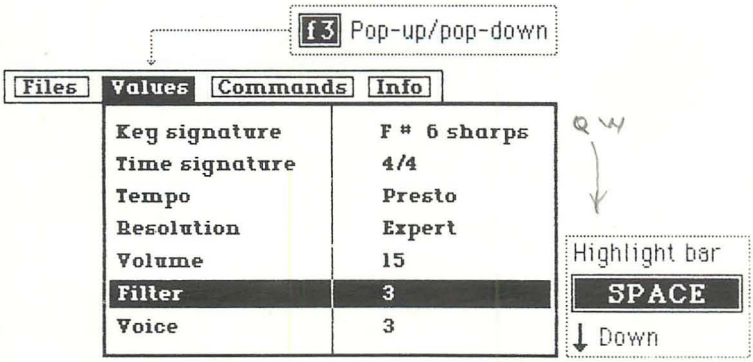


You will notice that each of the pop-ups except INFO **F7** has a horizontal HIGHLIGHT bar or cursor which can be moved by pressing the **SPACE** bar. This highlight cursor can also be moved in the opposite direction by holding down **SHIFT** while pressing the **SPACE** bar. The highlight cursor is used to select the function you intend to use.

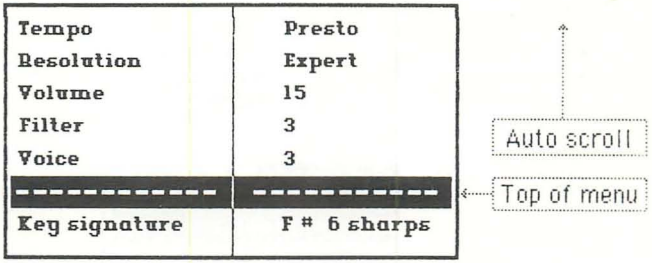


Menu auto-scroll

In some cases, when the highlight reaches the bottom of a pop-up menu, the menu itself will automatically scroll up, displaying new functions. It is important to remember this feature. If you are looking for a particular function and can't see it within the selected pop-up, scroll the highlight cursor up or down to auto-scroll the menu itself. You may reset the menu after an autoscroll by pressing the function key to pop-down the menu window and pressing the same key again to pop it back up.



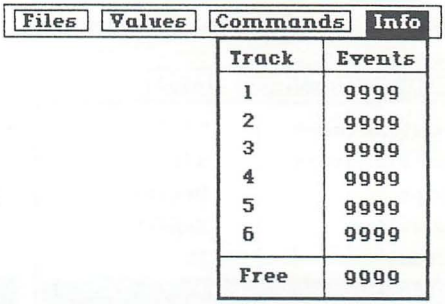
The menu scrolls in a loop, a broken line showing the top of menu.



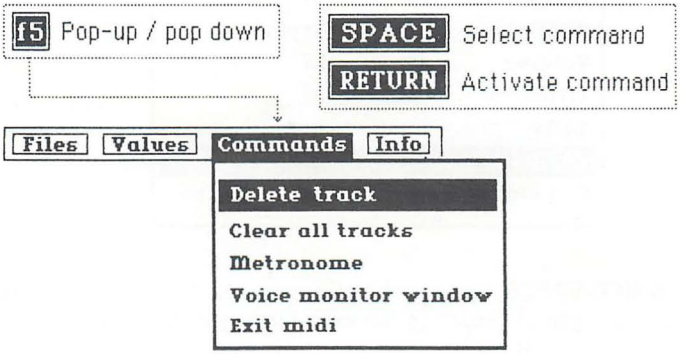
The **SHIFT SPACE** key combination causes the reverse to occur. When the highlight reaches the top of the pop-up window the menu auto scrolls down.

Each item within the VALUES pop-up represents a value that can be changed. For example when TEMPO or KEY SIGNATURE are selected, the value can be changed using either the **Q** or **W** keys. These keys are used throughout the system to change values.

The INFO pop-up only provides information and you can not directly change it. Quantities such as available space, the size of individual voices, and the values of important controls are displayed. This is the information that you will often need to check during the operation of TMS.



The FILES pop-up and the COMMANDS pop-up both expect you to activate a selected function by pressing **RETURN**. Often the action of pressing **RETURN** will produce one or more secondary pop-ups either as a second interactive window, or as simple messages or warnings. Remember, pressing the same function key will close down the window.

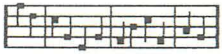


FILES

The most important function of the COMMAND LINE is to control the loading and saving of files. Depending upon which module you are in, TMS uses up to six different types of file.

Music files - Prefix **m**. Music as created by the EDITOR, KEYBOARD, or converted from MIDI. Music files can be loaded into the LINKER, MIDI, SYNTHESISER or PRINTER.

Sound files - Prefix **s**. Created and/or edited by the SYNTHESISER and are used by the EDITOR, LINKER and KEYBOARD modules. Each sound file can store 15 different instrument sounds.



Midi files - Prefix **x**. Created via the MIDI module, and require an external midi keyboard and interface. Midi files are easily converted to TMS music files for use by the EDITOR and back to MIDI files for playback through a MIDI.

Linker files - Prefix **l**. These files can only be created and used by the LINKER. They use music (**m.**) files to produce much longer and more complex compositions than the EDITOR or KEYBOARD alone can provide.

Notepad files - Prefix **n**. These are special files that are used by the EDITOR to allow you to 'cut and paste' sections of music between voices or even between music files

Text files - Prefix **t**. These files are created and used by the PRINTER module: they are files of Lyrics that are normally associated with specific music files.

It is very important that you ensure, when loading and saving files, that the file is of the correct type. It is possible that two or more files can have the same file name but different file types. ie. **s.jazz** is a sound file whereas **m.jazz** is a music file.

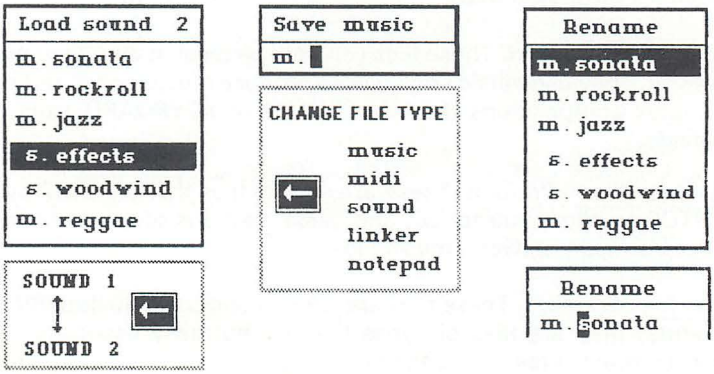
Examples	x. rock	midi file
	m. sonata	music file
	s. piano	sound file
	l. bigtune	linker file
	t. words	text file
	n. goodbit	notepad file

FILES options

To CATALOGUE the files available to the module you are in, first select the FILES pop-up by pressing **f1**. Then move the highlight, using the **SPACE** key, to select CATALOGUE. Press **RETURN** and wait a few moments. If the disk contains any available files, then these will be displayed within a CATALOGUE pop-up. Press **RETURN** to close the pop-up.

To LOAD a file, select the FILES pop-up **f1**, move the highlight bar to *LOAD* press **RETURN**. After a few moments a pop-up will appear with a catalogue of files available to the module. Move the highlight over

the file you wish to load and press **RETURN** . After a short delay the file will be loaded into the module. If the filing system can't find a file or encounters some other problem, a pop-up message will occur.

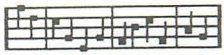


To SAVE a file select the FILES pop-up **F1** move the highlight to SAVE and press **RETURN**. A small save pop-up will occur and wait for you to type in a file name. The <- key can be used to change the file type. Make sure that you use the correct file type. If you try to save a musical composition as a sound (s.) file, then the current sound set will be saved, and not the music. When you have entered a file name next to its correct file type prefix, press **RETURN** and the file will be saved to the current disk. You cannot save files to the TMS system disk. It is write protected. You will need a new disk to save new or edited files.

To RENAME a file select the FILES pop-up and move the highlight to RENAME (as above) and press **RETURN**. A catalogue will be displayed. Move the highlight to the file you want to rename, press **RETURN** and type in the new name. Press **RETURN** and the file will be renamed. You may use the CATALOGUE option to check the renamed file.

You may DELETE a file in the similar way. A catalogue will allow you to select the file you wish to delete.

WARNING



TMS may not function correctly if additional, or worse still exotic hardware add-ons, are connected to your Commodore 64. The disk filing system may not operate correctly when used in areas with a poor or fluctuation mains power supply. Large magnetic fields generated by some TV's and loudspeaker systems could also create problems. Keep your disk drive in good condition and operate it away from the above mentioned demons.

Filing Errors

If the disc drive reports any problems during filing operations, these will be shown as "Disk Error XX" pop-ups. Look in your 1541 Disc Drive manual to find out the nature of the error. (Refer to "DOS ERROR MESSAGES")

The most likely errors are:

1) Disc Error 21 - No disc in the disc drive! It can also mean that your disk is unformatted; or, more seriously, your disc drive is faulty.

2) Disc Error 26 - This happens if the disc is "write-protected", and probably means you are trying to save files to the System disk.

* Do not attempt to VALIDATE a disk which contains TMS files, as this may result in the files being erased.

* All TMS filing operations only work on TMS files, so, for example, non-TMS files will not be displayed in the catalogue, and cannot be renamed, deleted etc.

* New discs must be "formatted" on the CBM64 before they can be used to store files. If you have a new (unformatted) disc, then before loading TMS, put the new disc in the disc drive and type:

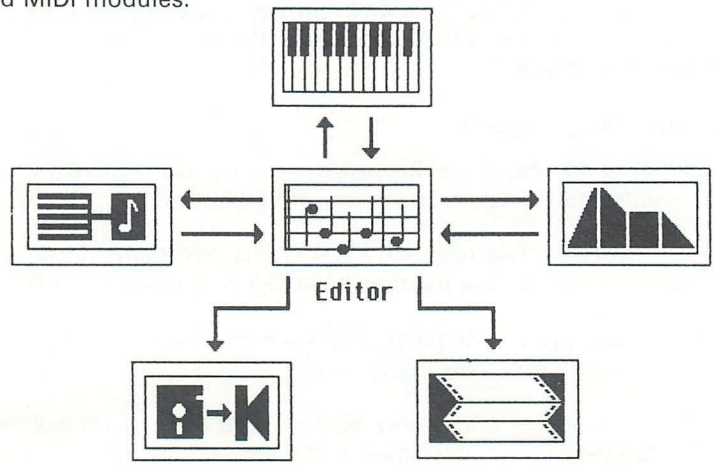
OPEN 15,8,15,"NEWø.name,ID" <return>
CLOSE 15 <return>

N.B. Refer to the "NEW" command in your Disc Drive User's Manual.

Audio Link. With care you can easily connect your Commodore and TMS to your HI FI, with spectacular results. Connect your HI FI lead to pins 2 and 3 of your video DIN. (C64's programmers reference guide.) Shield to pin 2 and core to pin 3.

EDITOR

The EDITOR module provides all the facilities of a wordprocessor; writing, displaying and editing music rather than words. The EDITOR can of course play the tunes as well! Tunes may be entered directly on the staves, played and edited using the very comprehensive facilities available within the EDITOR. The EDITOR also provides the unique function of displaying and editing tunes entered via the KEYBOARD and MIDI modules. There is even a command for 'tidying up' the results of your accomplishments with a keyboard! The EDITOR also provides the finished files for the PRINTER module and can also create tunes and backing tracks for both the SYNTHESISER and MIDI modules.



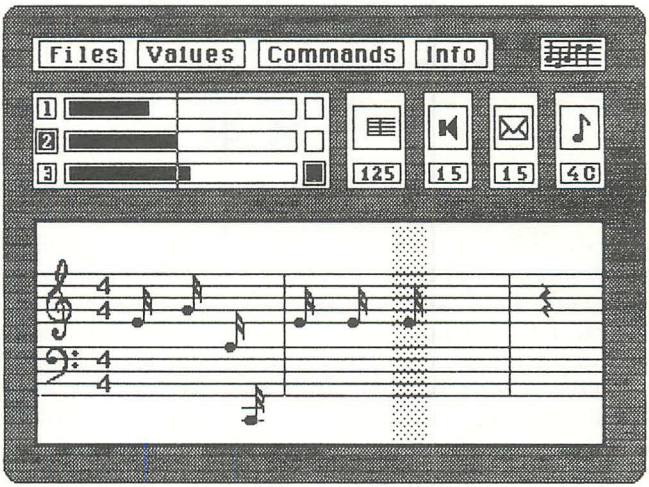
The EDITOR displays notes within the selected four octave range on treble and bass staves together with the appropriate key and time signatures. One of the three voices may be displayed, scrolled through (with or without playing) or edited at any time. You may flip instantaneously between voices at exactly the same point in a tune and play selected voices together from any note. The barmeter device shows you exactly where you are in a tune.

Music can be transposed instantly into any available key with the insertion of the appropriate accidentals. Music can be entered in practically any time signature with the facility for automatically entering barlines and ties where necessary. Most common musical notation is catered for including triplets, ties and repeats. The versatile loop sections may be used and edited in this module.

The EDITOR features many powerful facilties for editing musical compositions. There are block move, copy and delete facilities just like most wordprocessors and even a notepad for storing sections of music for later use. The EDITOR also includes many MACRO editing facilities for the more advanced user.

The EDITOR screen

The EDITOR module can be selected from the CONTROL screen by highlighting the EDITOR icon and pressing **RETURN**.



The screen consists of a large Voice Monitor Window (VMW) at the bottom displaying the notes in any one of the voices; a barmeter followed by the barnumber, volume, envelope and notename devices. A Free Space device also appears in the top left of the VMW. You can return to the CONTROL screen by accessing Commands: *Exit Editor* or pressing **COMM-HOME**.

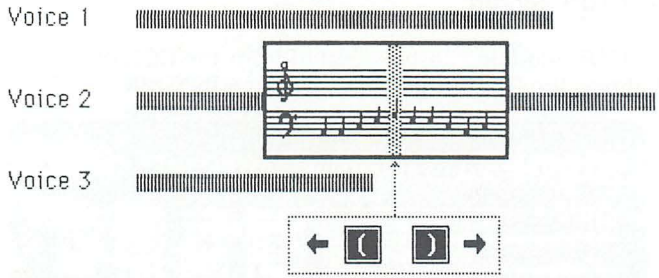
The following sections briefly describe each of the EDITOR devices. Move on to 'Entering and playing notes - a quick guide' if you really want to start composing straight away! (p.14)

VMW

The Voice Monitor Window displays a part of the tune stored in memory. A tune can have up to three voices and the VMW can show

a small part of one of those voices. The window can be flipped between voices by pressing **1, 2,** or **3**. The notes in that voice can be scrolled through the window using [and]. You can also hear them as they scroll by using **SHIFT-RUN/STOP**.

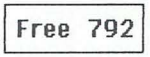
The diagram below shows the VMW looking into part of Voice 2.



Inside the VMW there is a white vertical band called the note cursor. This marks the 'current note' - the one that can be edited or sounded. When notes scroll past they sound when they reach the cursor column. When flipping between voices the current note in the new voice is the one that would have been playing at the same time as the current note in the previous voice. If there wasn't a note playing then it will go to the last note in that voice. You can therefore flip easily between voices knowing that the notes 'line up'. The VMW also displays the appropriate key and time signatures selected from Values.

Free Space

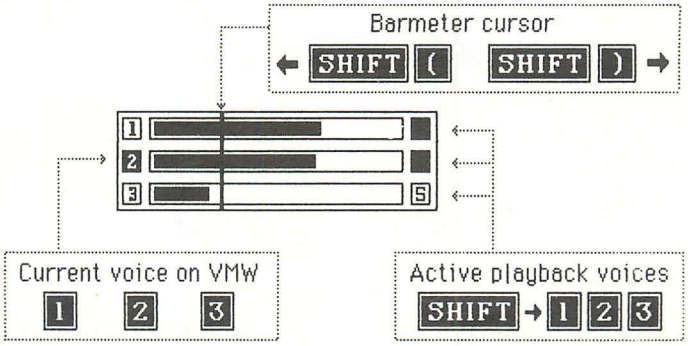
The EDITOR free space device is within the VMW and shows you how many notes you can add to your tune before running out of space. It also takes into account the space you have used up for your notepad. Look at Info to see what the notepad size is.



Barmeter

The EDITOR barmeter indicates the overall length of each voice relative to the others. Each voice is expanded to include all repeats. The barmeter cursor shows you where you are within a tune and moves left and right as you scroll backwards and forwards through a

voice. The highlighted voice number on the left indicates the current voice being displayed on the VMW. If you flip between voices then the barmeter cursor will not move unless the new voice is shorter. You can move the barmeter cursor quickly through a tune using **SHIFT-[and SHIFT-]**. When you release the keys the note cursor will point to the new section of music in that voice.



The small playback indicators on the righthand end of the barmeter are highlighted when voices are selected for playback. They remain highlighted until switched off. **SHIFT-1** is used to switch voice 1 on or off, **SHIFT-2** to switch voice 2 etc. Any combination of voices may be played back (including none!) irrespective of the current voice displayed on the VMW.

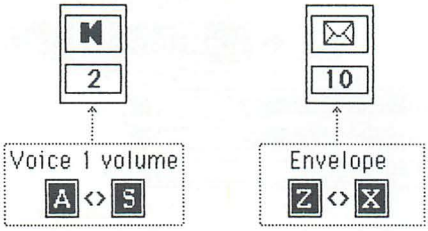
The playback indictors also show whether a voice is being played as a whole voice or as a loop section. An *S* indicates a loop section. Loop sections are intended to be used for repeated rhythm tracks, bass lines and accompaniments and are set from Values.

Bar number

The bar number device indicates the number of the current bar displayed by the VMW. Unlike the barmeter, repeats are ignored. When flipping between voices the bar number might not necessarily remain the same since it only counts the barlines and not the duration of the notes.

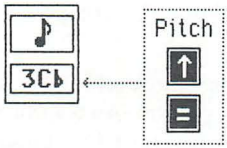
Volume and envelope

These devices display the volume and envelope associated with the current note on the VMW. The volume setting is an additional volume and can only be used in voice 1. The overall (or global) volume is set from Values. The envelope number for the current note is changed using **Z** and **X**.



Notename

For those of you who can not remember **F-A-C-E** or Every-Good-Boy-Deserves-Favours the notename device displays the octave, notename and accidental for the current note on the VMW. The key signature and any previous accidentals in the bar are taken into account. The notename for a rest is blank.

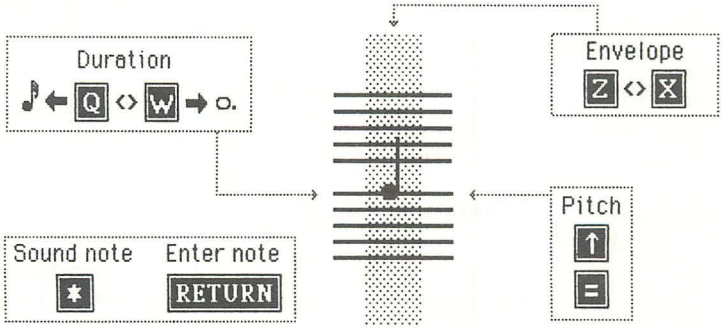


Entering and playing notes - a quick guide

The Editor is a very powerful composing tool with many facilities. This section is intended as an introduction - as you become more familiar with the basic commands you can launch yourself into the advanced editing facilities, set up the user parameters from Values, attack macros and get to grips with the notepad ... adjust barlines ... block tidy ... etc.

Notes are always entered directly on the treble and bass staves at the note cursor. If there are no notes in the voice the current note is shown in blue. If there are notes already there, you may delete all notes by accessing Commands: *Clear music*. A blue note has not yet

been stored in memory. It always appears at the end of a voice ready to be entered. The pitch, duration and envelope of this note can all be changed before it is entered.



Enter the note by pressing **RETURN**. If autosound is on the note will be heard. The newly entered note moves to the left and a similar note appears under the note cursor. Again this note may be edited and entered into memory by pressing **RETURN** . If you want to hear the note before it is entered press *. This is very useful when changing envelopes.

Once a note has been entered you can easily edit it by moving the note to the cursor position and changing the pitch, duration, etc.

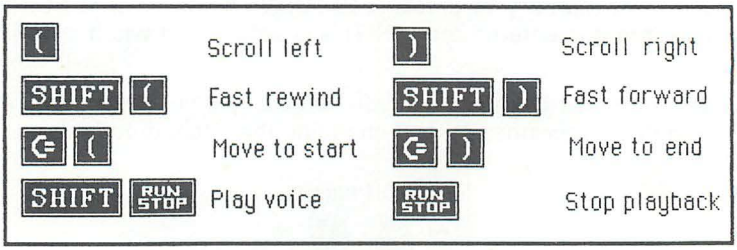
This time the note will appear black because it is a real note stored as part of the voice. You can press * to preview the note and press **RETURN** to move on to the next one. You could just as well press [or]to move onto another note.

To remove a note (it must be a real one!) move it to the cursor column and press **DEL**. To add another note to the end of a voice, scroll to the last note and press **RETURN**. A blue note will appear again for you to edit and enter as before.

As more notes are added to a voice barlines will begin to appear automatically according to the time signature. You may even find that some of the notes are automatically tied across a barline for you! In other cases you might be told that the bar is too long and the notes

can not be fitted in. Press **SPACE** and change the duration of the note so that the bar will be the correct length. The autobar and autotie parameters may be switched off in Values if necessary.

Having entered some notes move to the beginning of the voice and play the notes in that voice by pressing **SHIFT-RUN/STOP**. The notes will play and scroll right to the end. You can stop them playing by pressing **RUN/STOP** again. You can start and stop playing at any point in the voice. Notice how the barmeter keeps track of the notes you have entered in the voice and how the barmeter cursor shows where you are as you scroll through. You can move through a voice more quickly using **SHIFT-[** and **SHIFT-]** to fast rewind and fast forward. This time the notemeter cursor moves left or right without the music scrolling. Let go of the keys and the **VMW** will update itself to the new part of the music. Look at the barnumber device to see which bar you have reached. You can jump straight to the beginning of the tune by pressing **COMM-[** or to the end of the voice by pressing **COMM-]**. Remember that you have to press **RETURN** to get a blue note at the end again.



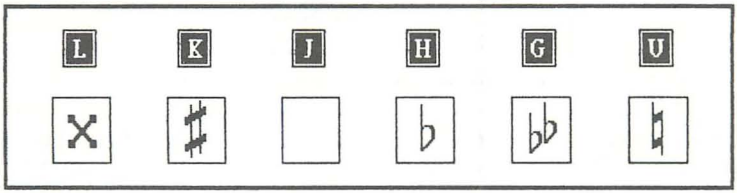
So far you have only used one voice and we'll assume that you have been entering notes in voice 1. Press **2** and you will be at the start of voice 2 - at a blue note again because no notes have yet been entered. Check that the barmeter shows number 2 highlighted on the left. Enter notes in exactly the same way as before until both voices are the same length. You can flip to voice 1 by pressing **1** and back again with **2**. Move to the start of voice 2 and press **RUN/STOP**. Both voices will play together without scrolling the music. Press **RUN/STOP** again to stop playback before the end of the tune. If both voices do not play then check that the playback indicators are all highlighted (on). On pressing **RUN/STOP** only those voices set for playback are heard. If none are on then you will not bear anything although the tune will actually be playing! Press **SHIFT-1** to switch voice 1 on/off; **SHIFT-2** for voice 2, etc.

Try adding a third voice in the same way as above but this time experiment with the envelope settings. Each note can have a different sound envelope attached to it. There are 15 envelopes available in sound set 1. Use **Z** and **X** to change the envelope number. Remember that you can preview the sound with * before entering it. You can always return to any note and change its envelope setting again. A whole sound set containing another 15 envelopes can be loaded into the EDITOR and this could change the sound of all the notes already entered.

Your new tune can be saved in the normal way through Filing. Press **f1**, select the *Save* option and press **RETURN**. Type your filename and press **RETURN** again. Remember that you need your own data disc in the disc drive and not the A.M.S. disc when you save a file. Your tune will remain in memory after saving it. A new tune could also be loaded but remember that this will delete your current tune and replace the sound set.

More on editing

Accidentals



Accidentals can be added to any note by pressing the relevant key. Notes are automatically put in the correct key according to the selected key signature so there is no need to put in sharps and flats where they are already shown in the key signature. If you require a note to be a natural, press **U**. Press **J** to cancel any accidental and therefore leave the note in the selected key.

In the EDITOR music is entered in proper musical notation. The usual convention of only showing accidentals once in a bar is adhered to. If a particular note, say C is made sharp (C#) any further C's at that pitch will be assumed sharp for the rest of that bar unless cancelled by a natural or any other accidental.

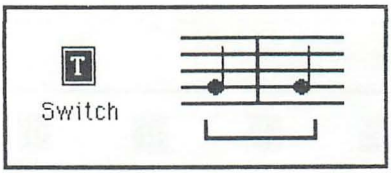
The EDITOR also uses double sharps and double flats. They do not appear in the most commonly used key signatures and are only

usually used when transposing tunes from one key to another (see the section on key signature for more details on transposition).

Rests

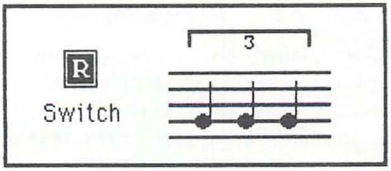
The current note can be switched to a rest by pressing **SPACE**. A rest can be switched back to a note by pressing **SPACE** again. Whilst switched to a rest the duration can still be set using **Q** and **W**. Any note below middle C will be switched to a rest on the bass stave, otherwise it will appear on the treble stave. Rests can be moved up or down between the staves. Rests can be tied together although, since there is no sound, it is not really necessary!

Ties



A real (black) note at the cursor may be tied to the previous note if it is of the same pitch. Blue notes can not be tied directly - they must be entered first. The envelope number (and volume) of the second note in the tie is taken from the first note. The tied pair will sound and move as one note with a duration equal to their total duration. A tie is removed by pressing **T** again. Notes may be tied across barlines but not across repeat markers (or loop sections).

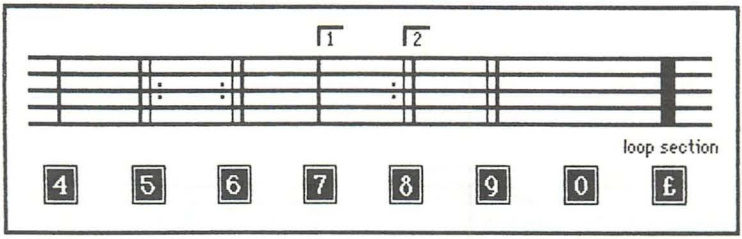
Triplets



Semiquavers, quavers, crotchets, minims and semibreves can be changed into a set of three notes with the same overall duration called a triplet. If you want three crotchet triplets, set the current note

to a minim and press **R**. Press **R** to turn the three notes back to a minim again. Once entered, the pitch, envelope (and volume) of any of the notes may be changed. You cannot change the duration! You can not delete any single note in a triplet ... the entire triplet will disappear! Barlines cannot be inserted within a triplet.

Barlines and repeats

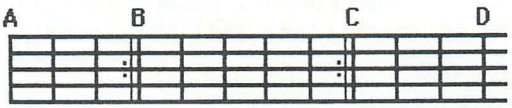


Pressing **4** will enter a barline to the right of the current note/rest. Barlines may be entered at any point in a voice except between triplets and in front of the very first note. In fact, there are no restrictions on the use of barlines in the EDITOR. Other barline symbols are entered in the same way and although there are no restrictions on their use, unusual positioning of repeat symbols will produce unusual results! Barlines can be removed by pressing **0**.

Barlines are entered automatically at the end of a voice if the autobar facility is on. This is set in Values. If the autotie facility is also on, then the EDITOR will usually be able to make each bar the correct length according to the time signature. This is often accomplished by splitting the entered note into two parts and tying across the barline. With autobar on, the EDITOR will not automatically enter a bar of incorrect length at the end of a voice: Another method of checking and automatically entering barlines is via Commands: *Adjust barlines.*

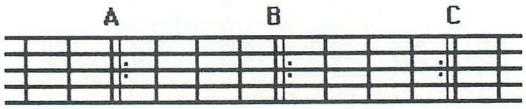
After complete bars have been entered, changing the duration of a note within a bar will make the bar length incorrect according to the time signature. The EDITOR does not check for this directly since you may actually want to insert a 3 beat bar in a nominally 4/4 time signature. However, you can easily check each voice for correct barlengths using Commands: *Check barlines*. When notes are deleted the attached barline or repeat symbol is also deleted. The start of repeat symbol (key **5**) is implied at the beginning of each voice and by inserting an end of repeat symbol (key **6**) further on in the voice the rune will repeat from the beginning again.

Repeats cannot be nested. However, the tune will not stop playing whatever you enter in the way of repeats, first and second time bars. Here are some examples of what will happen:

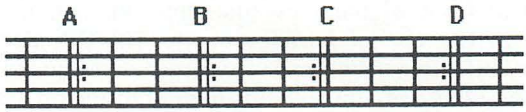


plays A-B, A-B, B-C, B-C, C-D

Note that the symbol at B acts as a :‖: where necessary



plays A-B, B-C, B-C

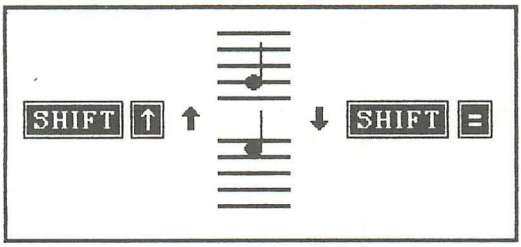


plays A-B, B-C, B-C, C-D, C-D

The first time bar symbol (key **7**) marks the start of a first time bar. In fact, there can be any number of bars before the end of repeat symbol. If you forget to put in the repeat symbol after the first time bar symbol it will just be ignored. The second time bar symbol (key **8**) is normally used to mark the end of a first time bar. The double bar symbol (key **9**) and behaves just like a normal barline. The final symbol (key **£**) marks the start of a loop section. These are described fully in 'Loop Sections'. However, if a voice is played as a whole voice (with *Section* off) then these markers behave as normal barlines.

When playing and scrolling through a single voice with **SHIFT-RUN/STOP** the repeat markers and 1st and 2nd time bars are ignored. The notes on the stave play purely in the sequence they appear. When playing voices with **RUN/STOP** all repeat symbols are obeyed. The EDITOR keeps a note on whether you are first or second time through a particular repeat section. You can often see this from the position of the barmeter cursor which counts the voice in expanded mode. When playing all voices from within a repeat section that section will not be repeated again if you are second time through. If you have scrolled

into the repeat section in that voice it is assumed that you are first time through. However, if you have entered from another voice perhaps without a repeat section then you could quite likely be second time through. This feature allows for flipping between voices and ending back at the same point irrespective of repeats in any or all of the voices. When scrolling past an end of repeat symbol (1st time through) the barmeter cursor will jump forwards indicating that the second time through that section has been missed out.

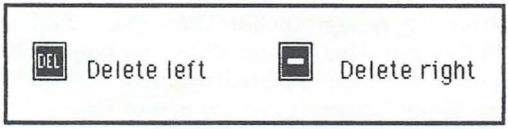


Pressing **SHIFT** together with ↑ will increase the pitch of a note by 1 octave assuming that the new note is still within range and there are no accidentals in effect in that bar. Press **SHIFT**-= to go the other way. This command is particularly useful when used as a macro command for transposing sections of a voice by an octave (see Commands: *Set macro*).

Inserting notes

Notes can always be added to the end of each voice if there is sufficient free space. Look at Info to see what is available and how much has been used in each voice. Notes can be inserted into a voice by pressing +. An extra note is generated at the cursor position and the notes are pushed one space to the right. The extra note will be identical to the original one. You can change the pitch, duration, etc. in the normal way. Note that the bar you are in might not now contain the correct number of beats. + is inactive at the 2nd and 3rd parts of a triplet. At the 1st triplet note, + inserts a single note of the same duration as the whole triplet. Whole sections may be inserted in a voice using the notepad facilities (see Files - notepad).

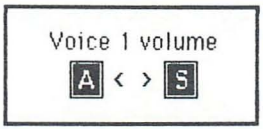
Deleting notes



Notes may be deleted forwards or backwards from the cursor position. **DEL** deletes the current note and the notes to the left are pulled in by one space. If **DEL** is kept depressed the effect is to 'suck in' the notes from the left eventually arriving at the start of the voice. – deletes in the other direction and if kept depressed will delete all notes to the end of the voice. The delete operation removes any barline symbol which is to the right of the current note.

You cannot delete ONE part of a triplet ... all three notes will be erased. A blue note at the end of a voice cannot, of course, be deleted since it is not yet stored. To delete large sections of a voice access Commands: *Block delete*. Use Commands: *Clear music* to delete all voices.

Volume



Due to the nature of the CBM64 hardware it is only possible to sound all notes at one particular volume at any time. This means that you cannot set different voices at different volumes directly. However, TMS does allow you to change the volume of a tune in a number of different ways.

Firstly there is an overall volume control in Values. This is called the global volume since it affects all notes alike. Secondly you can give each note in VOICE 1 an additional volume called the voice 1 increment. When voices are played back together the actual volume is equal to the global volume (from Values) PLUS the voice 1 increment (for the note playing in voice 1 at that time). If there is not a note playing in voice 1 then there will be no increment. However, it doesn't matter if voice 1 is turned on or off – the increment is still

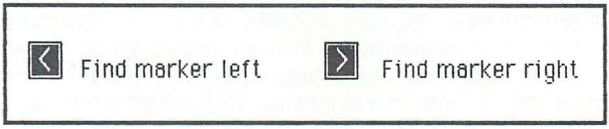
added. When voices 2 and 3 are played and scrolled,TMS can not take account of what's happening to the volume in voice 1 because of repeats, etc. In this case the actual volume is equal to the global volume plus the volume increment for THE FIRST NOTE in voice 1.

It does mean that you are able to add dynamics to voice 1 and the rest of the tune will follow suit. The volume device is only active in voice 1 where the volume increment of each note can be set to between 0 and 15 using **A** and **S**. If the note volume plus the global volume is greater than 15 the volume device is shown in blue. This is because the hardware will not accept a volume greater than 15. If you set the global volume to 0 you have the whole range of dynamics available to you in voice 1 and hence in the rest of the tune. However, perhaps the best way to start is to set the global volume to say 7 and use volume increments of between 0 and 8 for dynamics.

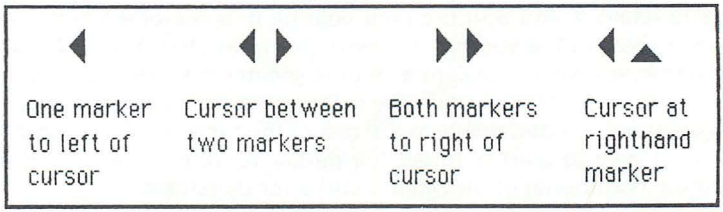
Despite having to play the notes in all voices at the same volume at any particular time there are two ways of changing the effective volume between voices. You can choose or define a filter (in the SYNTHESISER) which reduces the actual volume of a note. Since the filter can be on or off in any voice this gives a fair measure of control. Finally changing the shape of a note - the ADSR part of the envelope can considerably soften the note.

Markers

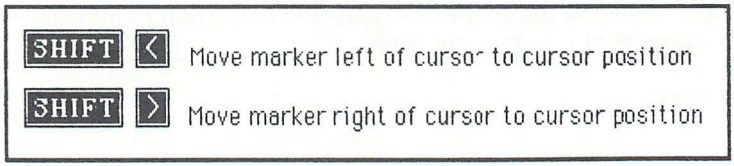
One or two markers may be used in each voice to assist in the editing of a tune. Markers are inserted under the current note by pressing **M** and deleted by pressing **M** again. Pairs of markers are required to define a section of a voice by many Commands including Macros. They are also particularly useful for labelling the start of a particular section of a voice. If you need to play and scroll a single voice from a set point several times, position a marker there and use the < key to locate it again. A marker to the right of the cursor can be found by pressing >.



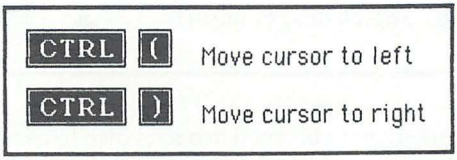
If markers are set they are displayed under the bass clef as either ◀ or ▶ depending on whether the marker is to the left or right of the cursor. You can therefore always see at a glance where the markers are.



There are other commands for moving markers. Accessing Commands: Markers to ends moves the markers to the start and end of the voice, and Commands: Delete markers removes both markers from the current voice. You can move either marker to the cursor using the following:



Moving the cursor



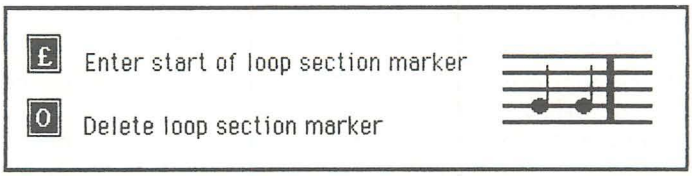
The note cursor is initially in the centre of the screen. For convenience it can be moved left or right.

Loop sections

Loop sections are an important feature of TMS. They can be created in the EDITOR or KEYBOARD as part of a normal music file. They are

intended to be used for repeated rhythm tracks, bass lines, etc. and are especially useful in the SYNTHESISER sequencer, KEYBOARD and MIDI for real time backing tracks. A loop section is a section of a voice or whole voice which when played as part of a tune keeps on repeating until the whole tune has finished. If all voices with notes in are loop sections then once started they will all repeat indefinitely until playback is halted.

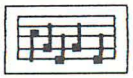
There may be up to 20 different consective loop sections within each voice. This means that a whole voice of say 20 rhythm patterns can be loaded in or constructed enabling you to literally dial up a different rhythm accompaniment whenever you need to.



Every voice can be considered as a single loop section and can be set as such in Values. A start of loop section marker (**I**) is implied at the start of every voice. A **I** is not required to end a loop section. To set up more than one loop section enter a loop section marker by pressing **£**. Look at Info to see how many sections there are in a voice. A **I** placed after the last note will give an extra loop section containing no notes. If *Section* is not set in Values (Info will say *Section* is *off*) the **I** markers are treated as normal barlines. If *Section* is set to *all* then the whole voice is treated as one loop section and repeats indefinitely. The playback indicators on the barmeter will also display an *S* if section is set.

If the current voice has *Section* set then the note cursor will always be within that loop section. The section, bounded by **I**, start or end of voice, is treated EXACTLY as if it was a whole voice and all editing commands are available within it. The VMW will show any notes in neighbouring loop sections (if any) but these will not be accessible.

The next start of loop section marker, if any, may be switched to a normal barline by pressing **4** and the loop section will be extended to the next **I** or end of voice whichever is reached first. The *Section* number remains the same and the number of *Sections* decremented. A **I** may also be inserted within a loop section. In this case the *Section* number and number of *Sections* are incremented by one.



The beginning of loop section marker which is implied in section 1 (start of voice) cannot be accessed since it belongs to the last note of the previous loop section. If *Section* is changed in Values the note cursor will move to the start of the specified loop section. If you want to browse through available loop sections set *Section* off.

If *Section* is set the barmeter displays the length of that voice as the length of the particular section irrespective of the length of the entire voice. Because loop sections can be repeated several times (it might even consist of just one note!) the barmeter cursor can go past the end of a loop section bar. It is assumed that the loop section continues until the end of the longest voice (or loop section). Do not worry because the EDITOR knows exactly how many times the loop section has been repeated and will always enter the loop section at the correct point when flipping between voices .

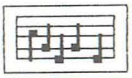
You can scroll backwards and forwards through a loop section or use **SHIFT-[** and **SHIFT-]** to fast rewind and fast forward. However, you will never get beyond the bounds of the loop section and might not even be able to reach the end of a loop section if the barmeter cursor reaches the end of the longest voice. Press **COMM-]** to go to the end of the loop section the FIRST TIME THROUGH. The barmeter cursor will actually jump backwards! **COMM-[** is equivalent to moving to the start of the voice.

Markers are available within loop sections. As there are only two per voice, any markers set in a previous loop section will be deleted and hence available in the current loop section. Accessing Commands: *Markers to ends* places the markers at the ends of the loop section.

Normal repeats are active within a loop section. The start of loop marker (**I**) acts as a II: if necessary just like at the beginning of a voice. Part or whole of a loop section may be copied or moved to the notepad (see Commands). Any **I** markers are converted to double bars (II) to avoid problems caused by moving too many loop sections. These will need to be switched back to **I** if the number of sections is less than 20.

A final point. If all voices are loop sections then play continues until aborted by **RUN/STOP**. In this case the barmeter cursor moves to the position of the last note played in the LONGEST SECTION. The corresponding notes in other voices will not necessarily be the last notes played unless all the loop sections are of the same length.

THE EDITOR Command line



Apart from the normal filing problem and status information, the Command line is used to set user parameters and access the many Commands available wihin the EDITOR. These are described below.

Files F1

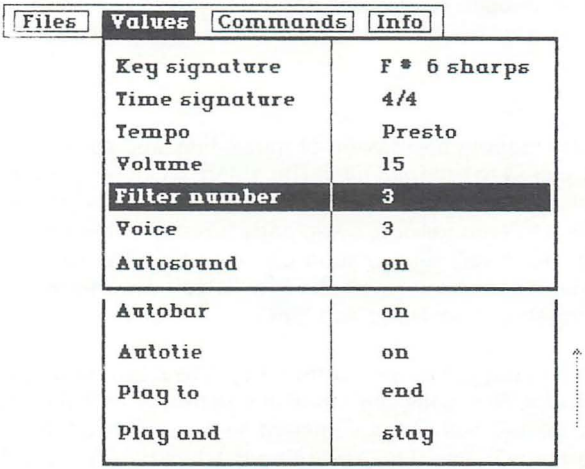
Apart from the loading and saving of music files and sound sets, the EDITOR has access to notepad files. The notepad can be used to store all or part of a voice. Often it is used temporarily to move sections from one voice to another or to swap parts around within a voice (see Commands). However, the notepad can also be used to store and retrieve whole voices such as rhythm tracks and even to merge two music files together (see Hints and Tips).

A notepad file is loaded in the normal way. They can be recognised by their **n** . prefix. Notepads can range in size from 1 to 999 notes and will only be loaded if there is sufficient free space available. If the notepad is already in use then a warning is given before replacing it. None of the music parameters such as key signature or time signature are changed when a notepad is loaded. You will therefore have to be careful about key signatures since the music in the notepad could have been originally written in a different key.

The current notepad may be saved on disc at any time. It might be a good idea to make a note of the key signature it was composed in. You can always of course, load it in separately, move it to a voice, transpose it and save it as a notepad file once more.

The current notepad is erased when any music file is loaded. It is therefore important to save the notepad file *before* replacing the music file.

Values f3



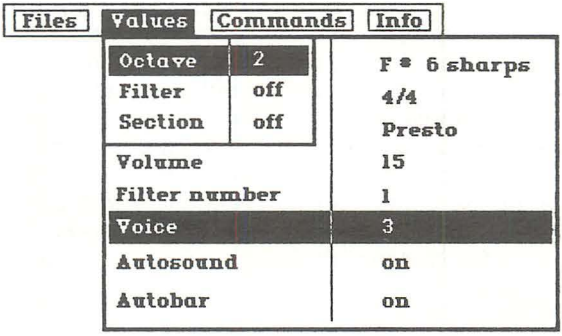
The *key signature* may be changed at any time in the EDITOR even when notes have already been entered. This is called Transposition (see page 34). Because of the differences in pitch interval a particular piece of music could quite possibly be transposed into some keys but not others. The EDITOR will not allow you to access any key signature that the tune can not be transposed to. It is possible therefore that particular keys will be missed out and there may be some tunes which cannot be transposed into any other key. Use the <- key to toggle between major and minor keys.

If the *Time signature* is altered after notes have been entered, the barlines will probably not appear in the correct positions. You will need to access Commands: *Adjust barlines* to reset the barlines according to the new time signature.

If *Tempo* is set high and you have written a piece of music using lots of semiquaver triplets (the shortest notes) then the poor computer might run out of steam when playing and scrolling a voice. It will be playing notes a LOT faster than you could manage on a piano! If it does tell you things are getting out of hand, just wind down the tempo a little and give the computer a rest!
Use the <- key to toggle between b.p.m. and Italian notation.

The *Volume* is the overall baseline volume for the tune. For notes on using this and the voice 1 volume increment see 'More on editing - Volume'.

Filter number gives the overall or global filter for the tune from the set of 4 filters defined in the sound set. The filter may be set off or on for each voice.



Voice gives the current voice number displayed by the VMW. Press **RETURN** to display the secondary pop up and change the *Octave*, *Filter* and *Section* Values for that voice. Press **RETURN** to pop this window down again. You can change *Voice* and pop up the secondary window again. All Values for each voice are displayed together in Info.

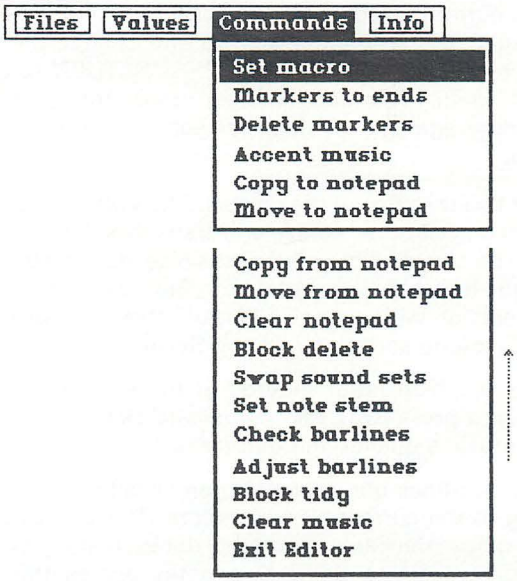
With *Octave* set to 3 the pitch of the notes on the VMW is then correct as written. Selecting another octave will transpose the voice up or down. *Filter* can be either off or on for each voice. If set *on* the voice is passed through the filter number selected. *Section* selects a particular loop section within a voice (if more than one) or turns the whole voice into a loop section (see Loop Sections).

If *Autosound* is *on*, blue notes entered at the end of a voice are sounded when you press **RETURN**. *Autosound* can be turned off to make entering music a quieter and quicker task.

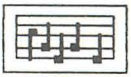
If *Autobar* is *on*, barlines are entered automatically at the end of a voice according to the current time signature. The EDITOR will not put in a barline unless the bar is the correct duration. If *Autotie* is also *on* then it might resort to tieing two notes across the barline. Otherwise it will ask you whether you want to tie over the barline or not. Press **Y** to tie, **N** to stay where you are and alter the duration of the current note so that it will fit. You will be warned if the barline cannot be inserted correctly. You must then either change the duration of the note(s) in that bar so that they will fit or enter a barline yourself (key **4**).

Normally voices or tunes are played to the end or playback is stopped by pressing **RUN/STOP** when you have heard enough. However, if *Play to* is set to *marker* then the voice or tune stops whenever a marker is reached in the current voice. The marked note is not played. Note that it does not matter if the current voice is actually being played at the time. This is very useful for repeatedly playing a particular defined section of music. A marker at the first note is ignored so that you can easily play between markers. You are also given the option of playing a tune (without scrolling) from the current note and staying there or moving to where the tune stopped. Set to *Play and move* for the note cursor to be updated to the last note played in the current voice. If the current voice has finished playing before the tune has finished then the cursor moves to the last note in the voice.

Commands f5



Set macro puts all notes between markers in the current voice into macro mode. There must be two markers set and the cursor must be on or between the markers. If not, this command will have no effect. In macro mode the cursor column colour changes to blue and a bar appears over the marker indicators. To exit macro mode press [or], access the Command line or press <-.



Macro mode set

The EDITOR macro facilities are provided to make editing of tunes quicker and easier. They are called macros because they can operate over many notes instead of one, as with the normal editing facilities. Whilst in macro mode altering the pitch (↑ or =), volume (**A/S** in voice 1 only) or envelope (**Z/X**) will not only alter the current note but ALL notes on and between the markers. There are two types of macro commands:

Relative adjusts the value of all notes up or down by the SAME AMOUNT as the current note.

e.g. transposes the section of voice up one octave.

Absolute sets values of all notes EQUAL to the value of the current note.

e.g. used to set all envelopes between markers to the same value.

The following table summarises the available macro commands.

	Relative	**Absolute**
	↑ Pitch +1 = Pitch -1 SHIFT ↑ +1 octave SHIFT = -1 octave	No command
	A Volume -1 S Volume +1	G A Volume of all notes set to volume of current note
	Z Envelope -1 X Envelope +1	G Z Envelopes of all notes set to envelope of current note

Markers to ends sets the markers to the beginning and end of the current voice (or loop section) whereas *Delete markers* removes both of them from the voice.

Accent music only operates when voice 1 is displayed on the VMW. It increases the volume increment for the FIRST note in each bar (between markers) by 1. This provides an easy method of accenting tunes. Access the command again to increase the effect. Note that if the overall volume setting (in Values) is too high you might not hear the effect of the accented notes.

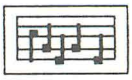
Notepad

This notepad is a section of the note storage area. The notepad size (given in Info) is only limited by the total number of notes already stored in voices 1...3. The notepad may be saved on disc at any time or a new notepad file loaded to replace it (see Files). The notepad cannot be directly added to; only replaced or deleted. *Copy to notepad* copies all notes between markers in the current voice to the notepad replacing any previous contents of the notepad. The voice is left as it was. This command will only be successful if there is enough free space in the note storage area. On the other hand *Move to notepad* will always succeed since the section between the markers is deleted.

Copy from notepad copies the contents of the notepad to the current voice at the cursor position leaving the notepad as it was. Of course, this again is limited by the available free space. *Move from notepad* also deletes the notepad after moving it. *Clear notepad* deletes the notepad. You will then have the maximum free space available for your composition. Note that loading any music file also deletes the notepad.

You will need to exercise some care when using the notepad facility if you also change the key signature because, unlike the rest of the tune, the contents of the notepad are NOT transposed to the new key. Look at Hints and Tips to see how the notepad can be used to merge two music files.

Block delete deletes all notes on and between the markers in the current voice (or loop section). Both markers are also deleted.



Swap sound sets swaps the position of sound sets 1 and 2. The sound set names will also be swapped. These are displayed in Info. All envelope numbers in the tune now refer to the other available envelope set. The filter will also change. This might change the sound of your tune somewhat! The new set will be saved with your music file. You can, of course, swap the sound sets again and return to using the original sound set 1.

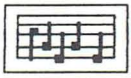
The flipover point for the note stem may be changed at any time by accessing *Set note stem*. A different flipover point may be set in each voice - these are stored with the music file. This enables the user to write bass parts correctly on the bass stave with the note tails pointing in the conventional direction. To set the flipover point set a note (blue or black) to the required pitch and access *Set note stem*. Any new notes entered will flip at the new point. All other notes remain unaffected. You can override the flip point by manually flipping the tails using /.

Notes near the top and bottom of the staves may only have their stems pointing down or up respectively. You can not alter these.

Check barlines will check that barlines are in the correct positions according to the time signature. This command only operates on notes between markers although it will actually start checking from the first barline it finds on searching backwards from the marker. If a bar is not the correct duration an error pop up *'Bar too long'* or *'Bar too short'* will be displayed where the error occurred. The markers are not moved.

Adjust barlines will attempt to insert or correct barlines according to the current time signature. Again this command operates between markers; the first marker being set at the start of the voice (or loop section) or the 1st note of a bar. A barline will be inserted to the left of the 1st marker if one does not exist already. Repeat symbols, first and second time bar symbols and loop section markers are never moved.

In attempting to fit barlines, notes may be split and tied across barlines, non-essential ties are removed and the durations of tied note pairs adjusted where necessary. If you do not want ties to be



automatically entered, use *Check barlines* and adjust any mistakes by hand. If a barline cannot be fitted correctly (even using ties) the note cursor will stop at the offending note and an error pop up displayed. The markers are not moved so you can try the command again after sorting out that particular problem manually.

Block tidy will attempt to remove unwanted rests from tunes entered via the KEYBOARD or MIDI modules. It will attempt to convert ALL single rests between markers to notes and tie them to the previous note. The overall timing is not affected by this command. Use *Adjust barlines* to remove unecessary ties and make the tune look even smarter!

Clear music deletes ALL notes in ALL voices and the notepad. You only need to use this before entering a new tune from scratch.

Exit Editor will exit back to the CONTROL screen as will **COMM-HOME**.

Info f7

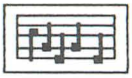
The normal music file information is displayed.

Hints and tips

Transposition

When a piece of music is transposed, the music sounds and is written at a different pitch from the original. The simplest form of transposition is by one octave. Individual voices may be easily transposed by changing the octave number from Values. Increase the octave number to transpose up by one octave. Part of a voice may be transposed by one or more octaves using the macro facilities (see page 31). If music is transposed by exactly one octave then the key signature is not changed.

If a piece of music is transposed by less than an octave then the key signature changes. Each transposition from one key to another will give a different pitch interval between the original and transposed notes. For instance, if transposing from the key of G to the key of C the pitch of each note will decrease by five notes. From C to B the pitch of each note will increase by seven notes.



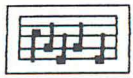
When the EDITOR transposes a tune it will first try and transpose the notes in the correct direction (either increasing or decreasing the pitch). If this is not possible because there are notes which would go outside the pitch range on the VMW then it tries transposing in the other direction. This is equivalent to transposing and increasing or decreasing the pitch by one octave. If this is not possible for the same reason that particular key is not available to be transposed to and it will not be shown in Values.

Transposition is very simple if the music contains no accidentals (sharps and flats) because the notes are simply moved up or down the staves to the new positions corresponding to the new key signature. In transposing from G to B flat for instance, every note on a G line will appear on the B line as a B flat. Because of the key signature the B note will not require a flat symbol. However, where a tune contains accidentals, for each accidental in the original there must be a corresponding one in the transposed version. Each of these new accidentals will have the same effect as the corresponding one in the original but it will not necessary be the same accidental since we have to allow for the new key signature. For example, in the key of B flat a B natural has been raised by one semitone from the given key. If the music is transposed to the key of G (which includes an F sharp) then the note will now be a G but its pitch will have to be raised by one semitone. It therefore becomes a G sharp. The situation can be rather more complicated in transpositions between certain pairs of keys and can give rise to double-sharp and/or double-flat symbols in addition to the normal sharps, flats and naturals. This is in accordance with normal music nomenclature.

Merging music files

The notepad facility allows you to save part or the whole of one voice as a separate notepad file. These files can then be reloaded and either added to an existing composition or used to form the basis of a new piece of music. If you need to add one whole music file on to the end of another try the following method. Note that the LINKER will already play up to 26 music files in any sequence.

a) Load 2nd music file (note key signature).
b) Move voice 1 to notepad and save as FILE2A, for instance.
c) Repeat for voices 2 and 3, saving as FILE2B and FILE2C.



d) Load 1st music file and check that key signature is the same as 2nd file, if not, transpose.
e) Load FILE 2A, go to end of voice 1 and access Commands: *Move from notepad.*
g) Similarly for FILE2C.

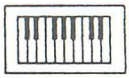
If you have not run out of room by now you will have one music file which may be played and saved as normal.

Using the sequencer

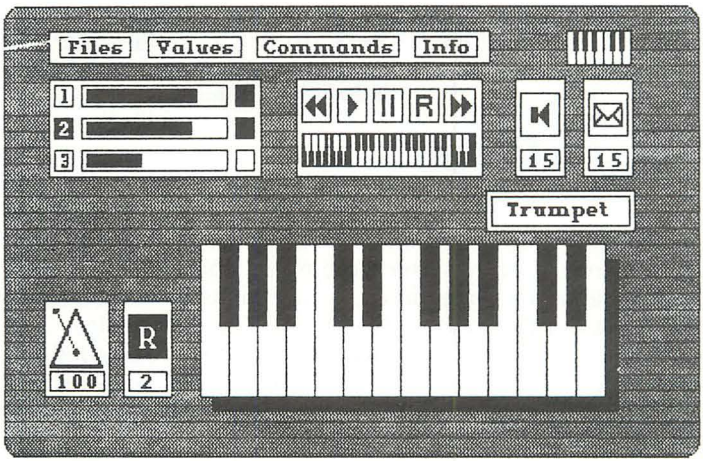
One of the uses of the sequencer in the SYNTHESISER Module is to create the right sounds for a piece of music after the notes have been entered. You will have already chosen or designed a sound set for use with a tune but you might want to experiment further once the tune is in. If you only want one particular sound per voice, then use the same envelope number for all notes in each voice, e.g. voice 1 can use envelope 3 and voice 2, envelope 9. Use the macro facilities if necessary.

If your musical composition is more complex you can divide each voice into loop sections by inserting loop markers (**I**) and assign a particular envelope number for each loop section. You can still play the whole voice by leaving *Section* off. Keep a note of the envelope numbers so that you know which envelopes to change in the SYNTHESISER when the sequencer is running. Each loop section can be dialled up (and played) individually for each voice in the sequencer until the sounds are right. Turn *Section* off, leave the voice envelope blank and the tune will play back just as it would in the EDITOR. You can save the music file (together with the sound set) from the SYNTHESISER.

KEYBOARD



The KEYBOARD module provides an alternative method of entering music into The Advanced Music System (A.M.S.). The upper two rows of **Q-W-E-R-T-Y** keys on your Commodore 64 are used to emulate the black and white keys of a piano keyboard. Keyboard overlays such as the Sight and Sound™ model can be used effectively. As a key is pressed a note sounds and the proper note name according to the key signature is displayed on the keyboard on the screen. The music being played or recorded can be displayed in real time on a pop-up VMW (Voice Monitor Window). Each note animates on the VMW showing changes in both pitch and duration.Music recorded via this module can be loaded into the EDITOR, and used as the basis of more complex compositions. The module may be looked on as a musical sketch pad: ideas can be quickly tried out in real time. The Keyboard also provides a useful means of experimenting with the sounds and effects created via the Synthesiser module.

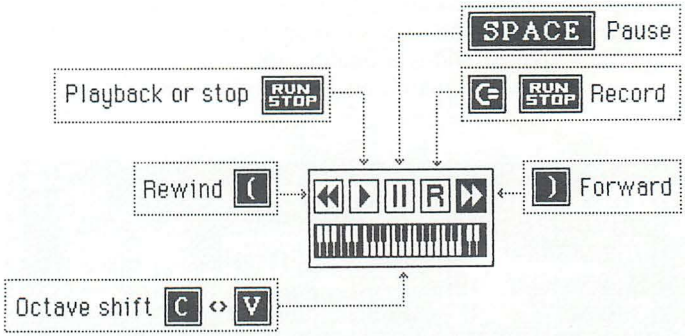


The Keyboard module is selected from the CONTROL SCREEN by highlighting the Keyboard icon and pressing **RETURN**.

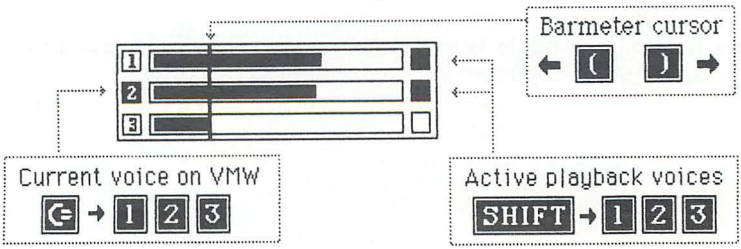
The Keyboard Screen

In common with the other AMS modules the Command Line at the top of the screen can be accessed via the four Commodore function keys. Command Line options specific to this module will be described at the end of this section.

The device in the centre of the screen, below the command line is the multi track DIGITAL RECORDER device. This indicates not only the Record, Pause and Playback status of the Keyboard but also provides a display of the current octave range of the keyboard. These will be described in more detail below.

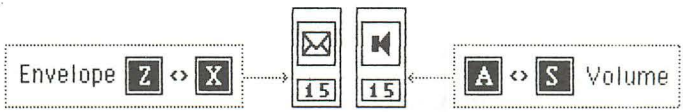


The barmeter device on the left of the screen provides a visual guide to the contents of each of the three music voices, as in the Editor module. When music is recorded, horizontal bars extend across the device indicating the relative overall length of each voice. Use the keys **COMM 1, 2,** and **3** to select the voice to be recorded (*active record voice, or current voice),* and **SHIFT 1, 2,** and **3** to select voices for playback. Voices selected for playback are displayed as highlights on the right side of the barmeter device.



The Metronome at the bottom left of the screen displays the current tempo in beats per minute (this maybe changed in the VALUES pop-up), and ticks from side to side accordingly. You may add a ticking sound to the metronome by setting "Metronome" in VALUES to "Tick". (This is only operative in Record or Practise Modes - see below).

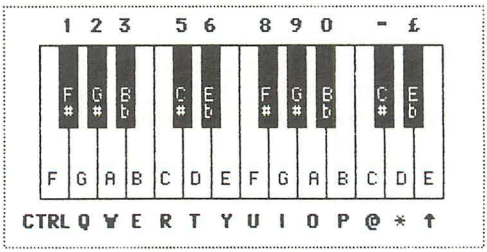
The two icons to the left of the DIGITAL RECORDER device indicate the current Volume and Sound Envelope. These may be changed using the keys **A, S, Z** and **X**. The sound envelope name is displayed in the small window just below the Envelope icon.



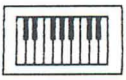
Keyboard: Modes of operation

The Keyboard can be set into various "modes".

It starts off in TINKLE MODE.
Press some of the keys on the top two rows of the keyboard, and the notes will sound as you press them. The keys correspond to piano keys as follows:



Try pressing **C** or **V** and notice how this makes the notes sound an octave lower or higher.
Press **Z** or **X** to change envelopes to get different sound effects.
Press **A** or **S** to change the Volume.
Pop-up the Voice Monitor Window (VMW) either via the Command Line **f5** option (*Display V.M.W.),* or use the **COMM-V** keys as a short cut for pop-up and pop-down. The music you play will be displayed note for note on the VMW. Note that the metronome will not sound in this mode.



If the V.M.W. is up the *current voice* is displayed in an icon next to the Metronome at the bottom left of the screen.
You may enter PRACTISE MODE by pressing **RUN/STOP**.
If there is no music in the current voice (or if you are at the end of the voice), you can "practise" playing music (the notes will not be saved to memory). If there is music in the other voices, they will play back too, and the metronome will sound if you have selected the metronome "tick" in VALUES.
Pop up the VMW and enter Practise Mode - the notes you play will appear on the VMW as the Tinkle Mode, but this time barlines will be added according to the selected time signature, and rests will appear while you're not actually pressing any keys.
Press the **RUN STOP** key to go back to Tinkle Mode.

RECORD MODE may be entered by holding down the **Commodore** key and pressing the **RUN STOP** key.
This is similar to Practise Mode except that any notes you play will be entered into the computer's memory!
Select the voice you wish to record by pressing **COMM 1, 2,** or **3** (described above), and enter Record Mode. Once again, any other voices with music in which are selected for playback will play, and any notes you play will sound and be entered into the current voice. Rests are automatically put in when you're not pressing keys.
Notice that the barmeter grows as notes and rests are recorded.
If you have the VMW up whilst recording, your notes will appear on the staves with barlines and rests.
Whilst you are recording, you may wish to change the octave range, the volume or the sound envelope, or simply stop for a breather! To do this, press the **SPACE BAR** to PAUSE: you may now press **C** or **V, A** or **S,** or **Z** or **X,** and then continue recording by pressing **SPACE** again.
To go from Record Mode back to Tinkle Mode, press **RUN STOP**.

To play back what you have just recorded, rewind to the beginning of the voice using the **[** key. (You can observe this rewind as the cursor line on the barmeter moving to the left.) Now press **RUN STOP** to play the music back.
If you want to continue recording, move to the end of the voice using the **]** key (the barmeter cursor should now be at the right hand end of the voice), and simply press **COMM-RUN STOP** again.

NOTE: if music already exists in the current voice, and if the cursor is not at the end of the voice, then it will be erased or over recorded when the Keyboard is set into Record Mode (after a Confirm pop-up).

Notice that the DIGITAL RECORDER device gives a visual indication of the current Keyboard mode by highlighting the appropriate icon. When the VMW is up, the relevant icon is displayed next to the metronome, together with the number of the current voice.

THE COMMAND LINE (KEYBOARD)

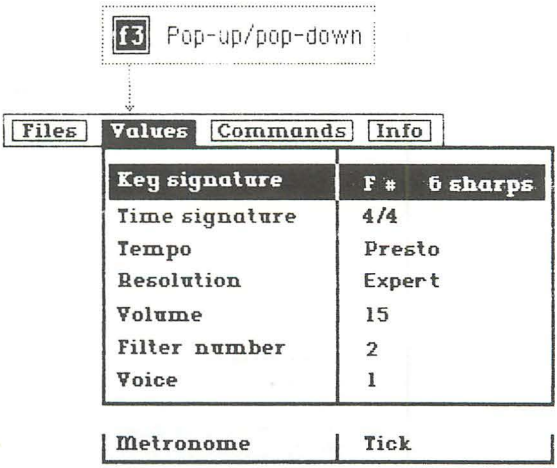
The general operation of the COMMAND LINE is discussed fully earlier in this manual.

Files f1

Both music (m.) and sound envelope (s.) files can be loaded into the Keyboard module. Only music files can be saved from this module.. The sound envelopes used within a composition are saved with the music (m.) file. DELETE, RENAME and CATALOGUE function in the usual way.

Values f3

Values may be selected as usual with the **SPACE** bar and changed with either the **Q** or **W** keys. Many of the VALUES available from the Keyboard are described in more detail in the Editor module section. There are, however, some differences.



Key signature - This value cannot be altered once music is either loaded or recorded into the Keyboard's memory. Transposition etc. is available in the Editor module. Switch to minor keys with the ← arrow key.

Resolution - This sets the minimum note duration that can be detected by the keyboard. The Keyboard does not allow you to play notes shorter than a certain duration so that your music will consist of proper notes and look reasonably tidy. With *expert* resolution the minimum note duration is a semi-quaver. With *average* resolution, it is a quaver, and *beginner* resolution will ignore all notes less than a crotchet's duration. Select a *Resolution* value in conjunction with *Tempo* to provide a comfortable keyboard response. At faster tempos you will be able to play quicker. The *Tempo* value is displayed at all times in beats/minute within the Metronome device.

Metronome - the audible tick maybe set to on or off (*tick* or *quiet*). There are, however, some limitations to the use of the metronome, since its sound actually comes from one of the Commodore's music voices. Therefore if you are playing all three voices you will not be able to hear the metronome tick.

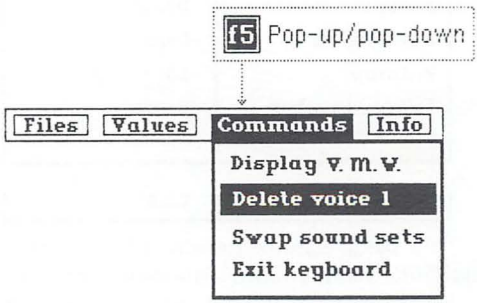
Commands f5

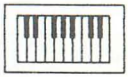
Display V.M.W. will pop up the Voice Monitor Window.

Delete Voice will delete the current voice, after asking for confirmation that you really wish to delete it!

Swap Sound Sets will swap Sound Set 1 with Sound Set 2, thus giving you access to the 15 envelopes in the second sound set.

Exit Keyboard allows you to exit from the module back to the Control Screen.





Info F7

For display only - provides current status information, including the number of notes and bars in each voice. You may see here how many notes you have entered, how much free space (i.e. how many notes) you have left, and the names of the current music files.

More on the Keyboard

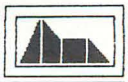
You may record music via the Keyboard one voice at a time while listening to one or both of the other voices. These other voices can be either previously recorded in the Keyboard or created in the Editor or Midi modules and loaded into the Keyboard module. Voices with loop sections can also be created within the Editor and utilized as a backing tracks or rhythm sections within the Keyboard.

If you are starting a new piece of music, remember to set the Key Signature and the Time Signature before you start recording, because they can't be changed in the Keyboard once any notes are entered. You can, however, go into the Editor module to alter these values if you wish.

During Record Mode the Keyboard attempts to convert the music you are playing from real-time durations to musical notation. Barlines, rests etc. will be inserted according to the selected tempo and time signature. However, you may find that anything other than simple tunes can produce rather untidy compositions, in that unwanted rests tend to creep in. Facilities exist within the Editor specifically to tidy up music entered in the Keyboard - see the Command *Block Tidy* in the Editor module.

When you exit from the module back to the Control Screen, any music you have in memory will be preserved. You may move onto the Editor, Synthesiser or Printer modules (and back again) without losing your file. However, if you go into the Linker or Midi, any music in memory will be lost, so be sure to save your files to disc before leaving the Keyboard if you intend to use Midi or Linker afterwards.

SYNTHESISER



The SYNTHESISER module provides the means of creating and editing the sounds used in the EDITOR and KEYBOARD Modules. It also features a real time sequencer which allows tunes to be played back while changing or editing the sounds.

Each sound is controlled by a set of parameters collectively called an envelope. The basic parameters consist of waveform (including pulse width where appropriate) and amplitude shape. The initial pitch and duration of the sound can also be edited so that the sound produced in the SYNTHESISER exactly mirrors the sound of notes on the staves in the EDITOR or KEYBOARD. There are 15 resident envelopes in the current sound set which may be used together with an optional filter. The filter parameters consist primarily of filter type, resonance and filter frequency.

Apart from the basic envelope and filter parameters the sounds may be controlled by the optional use of Dynamic Response Envelopes (DREs). The two DREs can transform the sound by independently modulating the frequency and/or pulse width and the filter frequency. The DRE is one of the more complex features of the SYNTHESISER and as such is left until the section 'More on creating sounds'.

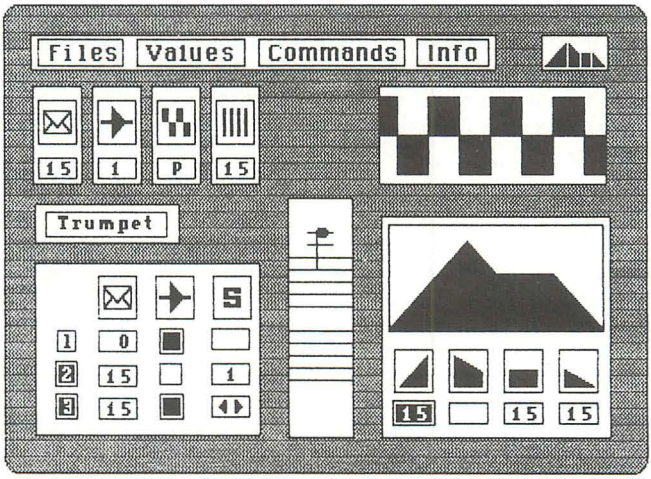
Any of the envelope and filter parameters may be changed and the resulting sound heard instantly. The SYNTHESISER also allows you to give a name to each of the 15 envelope sounds eg piano, violin or bass. These names may be used within the KEYBOARD and EDITOR to provide a useful description of the sound.

The sequencer can play up to 3 voices or tracks from the resident music file. Particular envelopes can be selected for each voice together with an optional filter. Apart from playing whole tunes, the sequencer is designed to utilise loop sections. At any time these short sequences, bass riffs, drum patterns etc may be selected for each voice and set playing. They will continue to play until stopped. This allows creative experimentation with rhythm and sounds using tunes or loop sections entered from the EDITOR, KEYBOARD or MIDI modules.

The SYNTHESISER screen

The SYNTHESISER module is selected from the control screen by highlighting the SYNTHESISER icon and pressing **RETURN**. The screen consists of a number of basic devices; envelope number, waveform, filter number and envelope name together with the amplitude, sequence and mini VMW device windows. The filter parameters and DREs are additional pop up windows and do not appear on the basic screen. You can return to the control screen by accessing Commands: *Exit Synthesiser* or pressing **COMM-HOME**.

The following sections briefly describe each of the devices on the basic screen. The more advanced features are described later in 'More on creating sounds'.



The devices are arranged in a circular manner. Only one device can be edited at anytime; this is shown highlighted by a white background. Pressing **SPACE** moves onto the next device in a CLOCKWISE direction. Pressing **SHIFT-SPACE** moves in the opposite direction (COUNTERCLOCKWISE).

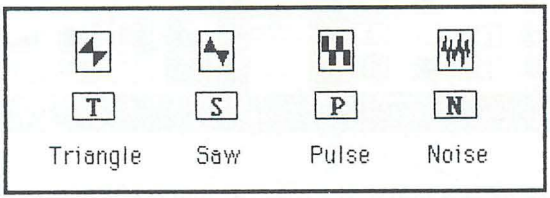
Envelope number

This device displays the number of the selected envelope from the current sound set (1). The envelope parameters and filter associated with this envelope are displayed and may be edited. You can change the current envelope number at any time using **Z** and **X**. It is also included on the 'circuit' and may be changed with **Q** and **W**; the normal editing keys (see 'Creating sounds-a quick guide').

When changing the envelope number all the parameters are updated including the filter. The new sound will be heard when * is pressed. Changing the envelope number itself has no effect on the sequencer. However, the filter stored with that envelope will become the new global filter and may therefore effect voices which have filter selected (see 'The Sequencer').

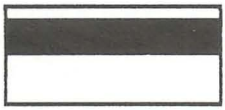
Waveform

The next device on the circuit displays the selected waveform icon and letter for the current envelope.

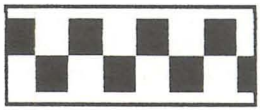


The waveform governs the timbre or frequency spectrum of the sound. Triangular waveforms tend to give rather mellow sounds, sawtooth waves provide brass and string sounds, and noise waveform, the percussive sounds like a cymbal. The pulse waveform is perhaps the most interesting since you can vary the proportion of the different harmonics by changing the pulse width. If pulse width is selected the pulse width device is displayed alongside. This is then included in the circuit.

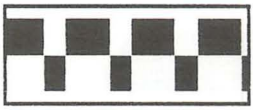
When highlighted the pulse width may be changed using **Q** and **W**. Some example pulse waveforms are given below.



minimum pulse width
(DC wave)



perfect square wave



intermediate pulse width

Filter number

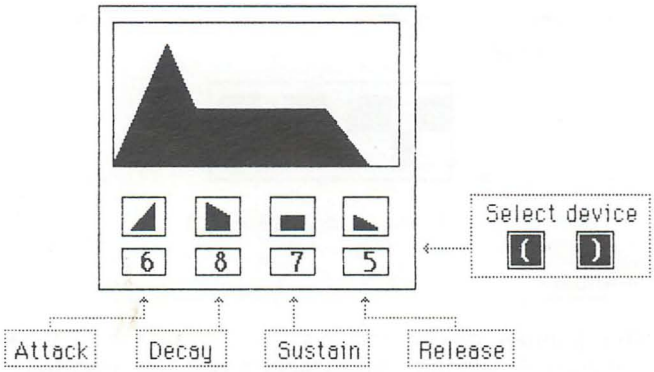
The filter number device displays the filter associated with the current envelope. The filter facility allows you to change the tone of the sound set and these can be edited in the same way as envelopes. For any envelope the filter can be off ( ) or set between 1 and 4.

The sound can only be passed through one filter at a time. Although you can select any of the four filters with each envelope and sound the note (*), when playing a tune there is only one filter available for all the envelopes. The filter may be on or off for each voice. This should be kept in mind when designing sounds for use in a musical composition. However, using the LINKER module, music files with different filters set can be strung together to give a varied musical composition.

When using the sequencer to playback a tune, the filter number device displays the one available filter. This could, of course, be set to off.

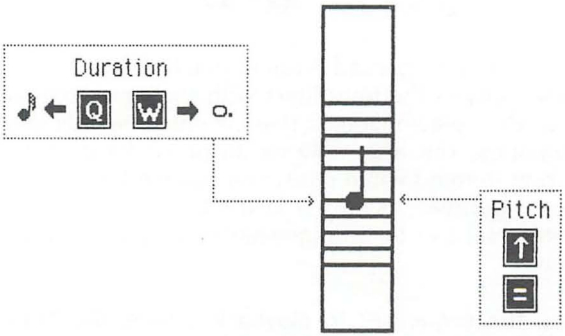
ADSR

The block graph in the bottom right of the basic screen represents the amplitude shape of the sound. The devices below the graph show the four parameters that control the shape of the ADSR graph. Highlight the appropriate parameter using [and]. Change its value using **Q** and **W**.



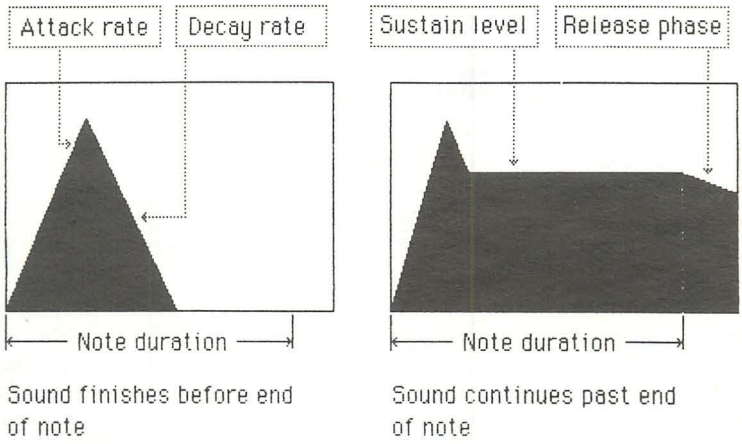
Mini VMW

The mini Voice Monitor Window behaves in exactly the same way as in the EDITOR module. The pitch and duration of the note can be changed.



This note sounds when you press *. When the sequencer is playing the mini VMW is replaced by the Dynamic Envelope Device. The octave setting of this note is determined by the *Voice1-octave*

number given in Values. The duration of the note governs the time before the release phase starts. With a large decay rate and zero sustain level the sound level will possibly reach zero before the note has finished. In the other extreme a short note with a low release rate can continue to sound for much longer than the actual duration while the sound fades away.

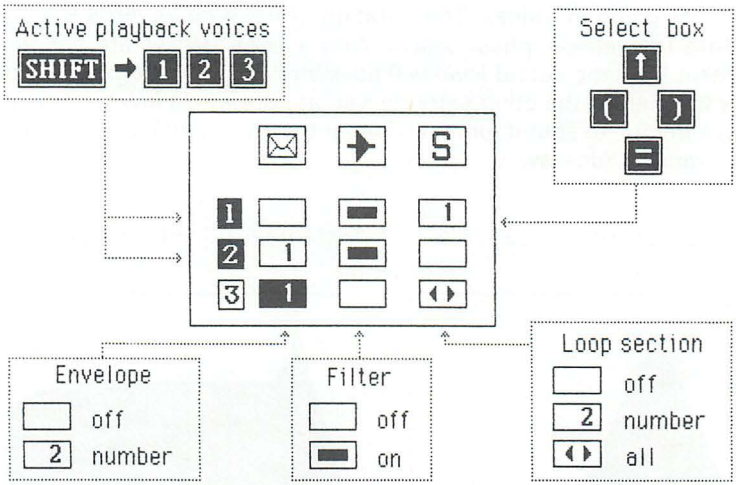


Sound finishes before end of note

Sound continues past end of note

Sequencer

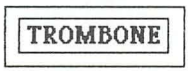
The sequencer panel controls the playback of music files within the SYNTHESISER. The active playback voices are shown as highlighted numbers on the left. **SHIFT-1** is used to switch voice 1 on etc. The sequencer panel is part of the circuit and when selected one of the values is highlighted. This value is changed using **Q** and **W**. Move the highlight around the panel using ↑, =, [and]. The envelope, filter and loop section may be set for each voice.



If an envelope value box is blank (ie. off) that voice will play back using the original envelope values in the music file. These are displayed in real time by the Dynamic Envelope Device. Any value between 1 and 15 plays ALL the notes in that voice using that envelope. The filter can be on or off for each voice. Section is used in exactly the same way as in EDITOR or KEYBOARD Values. A blank box (ie. off) means that any loop section markers are ignored; a number selects the loop section to be played for that voice and the double arrows means that the whole voice is repeated as if it were a loop section.

Envelope name

Each of the 15 envelopes can be given a name to correspond with the particular sound. You are allowed to type in up to 8 characters when this device is highlighted. Note that you can not enter spaces since **SPACE** will move you onto the envelope number device in the circuit! To change the envelope number while on the envelope name use **SHIFT-Z** and **SHIFT-X**. Note that you cannot be in the middle of editing a name so press **RETURN** first.



Creating sounds - a quick guide

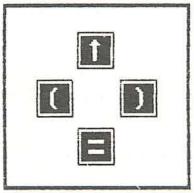
Sounds can be designed on their own or in conjunction with the sequencer. This section deals with the basic method of creating simple sounds.....dynamic effects such as tremelo, wahwah and phasing are converted later on.

Press * to sound the current envelope. You can change the volume in Values.

Change envelope with **Z** and **X** and listen to some of the other effects that can be achieved. Notice how the numbers and graph change as you move to another envelope number. If a sound continues too long (some envelopes last indefinitely!) then kill the sound with <-.

Some of the sounds are probably using Dynamic Response Envelopes and perhaps a filter. These are covered later. To make things easier access Commands: *zero envelope*. The current envelope is reset to the basic sound shape with the filter off. Move around the devices by pressing **SPACE**. Now press **SHIFT-SPACE** and go round the other way. This is exactly the same as selecting a module in the CONTROL screen.

When a device is highlighted you can edit the value(s) with **Q** and **W**. If there is more than one value box within a device window move the highlight around using the usual TMS up-down-sideways keys.



Move onto the waveform device and move through the four options. Notice that the letters might help you identify the different waveforms.....Triangle.....Saw.....Pulse..... you will probably instantly recognise the **N**oise waveform. Whenever pulse is selected the pulse width device appears. This is now part of the circuit so **SPACE** along and use **Q** and **W** to change the pulse width. See how

the sound goes from 'hollow' like a clarinet when the blocks are equal (called a square wave) to 'thin' like an oboe when the blocks are almost entirely on one side (called a DC wave).

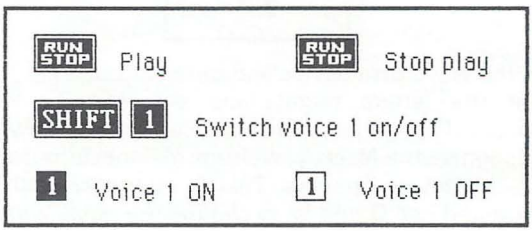
Leaving the pulse width move onto the ADSR window. The graph shows the amplitude shape of the sound. As you increase or decrease the values of the **A**ttack, **D**ecay, **S**ustain or **R**elease parameters, the graph and the sound change shape. Experiment with different shapes.....it's fun. Remember to press * to hear the new shape. If you set the release parameter (the one of the far right) to zero the sound might continue for ever! Press <- to relieve you of the agony!

Leaving the graph looking similar to how you found it, move onto the mini VMW. Change the duration of the note with **Q** and **W** and move the note up and down the staves with ↑ and = as in the EDITOR. A note in the EDITOR with this envelope would sound exactly the same.

Finally move onto the envelope name and type in the name of your new sound. The whole of sound set 1 comprising of the 15 envelope definitions and 4 filters can be saved in the normal way through Filing.

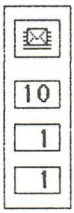
The Sequencer

The sequencer allows you to edit envelopes and filters whilst playing a tune giving an instant response to parameter changes. The sequencer plays music files just like the EDITOR and KEYBOARD modules. If there is already a music file in memory (look at Info to find out) press **RUN/STOP** and it will play from the beginning. If not, load a music file and try again. As the tune is playing try turning voices on and off. Press **SHIFT-1** to switch voice 1 on/off etc. The tune will continue to play until you press **RUN/STOP** again even with all the voices turned off!

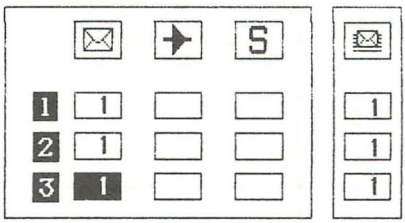


The tune will automatically restart when all voices have finished. This gives you plenty of time to change envelopes and filters. You can access the Command line while the tune is playing but if meanwhile the tune ends it will not restart until you pop down again. Try popping up Values and changing *Tempo* or *Voice 1-octave* for instance. You can also access Commands whilst playing. However, it is not safe to access files since the results are not very predictable!

When a tune is playing you have probably noticed that the mini VMW has been replaced by another pop up device. This is the Dynamic Envelope Device (DED). It monitors the envelopes that are playing with each note in every voice. If your tune has many envelope changes they provide a fascinating real time display.....who wants flashing disco lights?



Highlight the sequencer panel and move to one of the envelope boxes. If the box is blank the notes in that voice will be playing with the envelopes set in the EDITOR (or KEYBOARD). Press **W** to set all notes in that voice to envelope 1. Notice how the DED displays envelope 1 for that voice. Now set the other voices to envelope 1. Use **Z** and **X** to dial up the envelope 1 parameters. You can always change the envelope number whatever device is highlighted. The sequence panel and DED should now look like this:-



As the tune is playing move round the devices and change the waveform (pulsewidth) and ADSR graph.....you can also change the *Tempo* and *Octave* settings for each voice. Great fun isn't it? When you are changing parameters make sure that the envelope

number device shows one of the numbers you have set in the sequencer panel, otherwise you will not hear any changes.

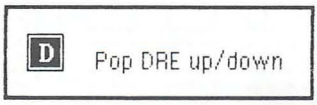
You can experiment with different envelopes for each voice and try turning voices on and off to hear the changes better (**SHIFT-1** etc). If there is a filter on (a number appears in the filter number device) try turning the filter on and off in each voice. The next section deals with actually editing filter parameters.

The final set of value boxes enable you to dial up different loop sections as a tune is playing. Refer to 'Loop sections' in the EDITOR part of the manual for details on setting up and using loop sections. If you have a tune loaded which contains more than one loop section in a voice then you can dial up any of the sections for that voice. When a new section is selected the tune restarts at the beginning again. If a voice contains rhythm tracks dial through these. Then you could dial up a suitable bass line for instance in another voice and add a melody line perhaps.....the possibilities are endless.

You can, of course, use the EDITOR, KEYBOARD or MIDI modules to enter and edit loop sections. Look at 'Hints & Tips' in the EDITOR for more help in using the sequencer.

More on creating sounds

A more complex but very powerful feature of the TMS sound system is the ability to sweep the pulse width, pitch and filter frequency of any note in any voice. Unlike the ring modulation and synchronisation effects normally associated with the CBM64, TMS does not require another voice to modulate these parameters. Instead, two Dynamic Response Envelopes (DREs) control the sweeping of the pitch and/or pulse width and filter frequency. Tremelo, phasing, wahwah and flanging effects are all within the scope of TMS and can be used in all 3 voices at the same time.

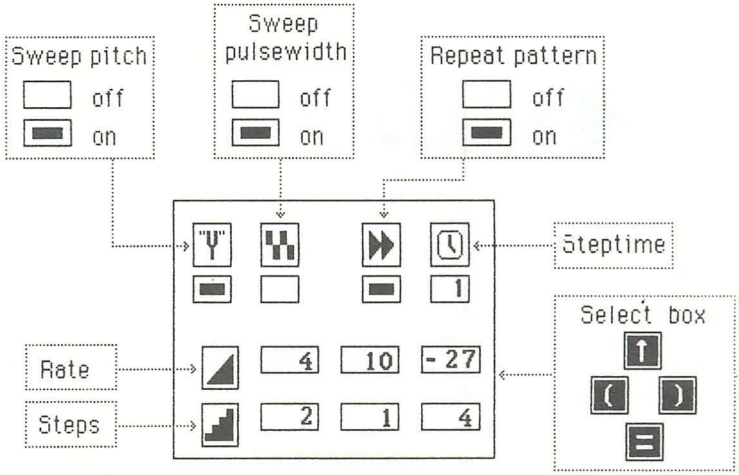


A pitch/pulse width DRE is part of each envelope definition whereas a filter frequency DRE is associated with each set of filter parameters. A DRE is popped up over the ADSR graph by pressing **D**. Pop it down by pressing **D** again. Alternatively access Commands: *DRE up/down*. If the filter devices are being displayed (see below) the filter frequency

DRE will be popped up. Otherwise the pitch/pulse width DRE will appear.

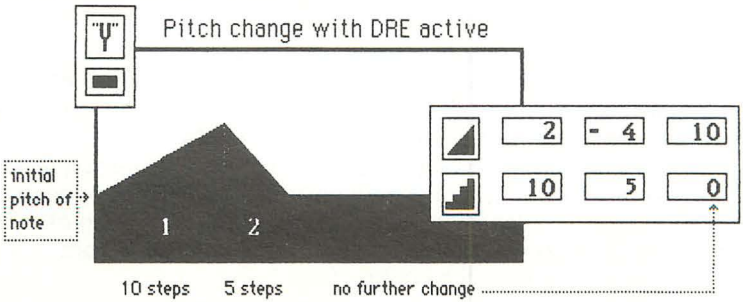
Pitch/pulse width DRE

This DRE can sweep the pitch and/or the pulse width of the note. Pulse width can only be modulated if the pulse waveform is selected. There are separate devices for selecting whether the pitch and/or pulse width are to be swept.

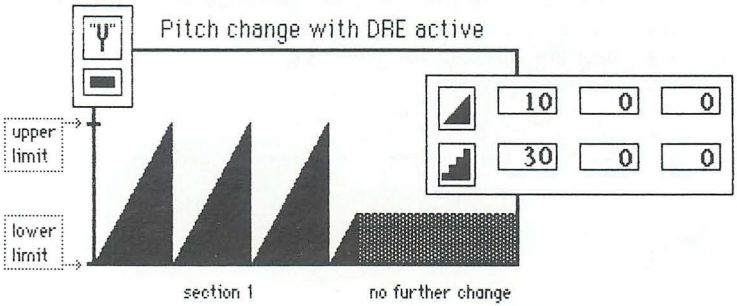


There are three independent sections each of which are specified by a step height (or rate) and a number of steps (section length). There is an overall step time which governs the actual rate of change of the pitch/pulse width with time. The smaller the step time the greater the rate of change.

A DRE section is ignored if the step number is zero. Each section follows on from the next.

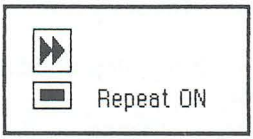


If the pitch reaches the upper pitch limited then it automatically folds down to the lowest pitch limit and vice versa. The pitch then continues to increase or decrease at the same rate. This effect is called foldover or wraparound.

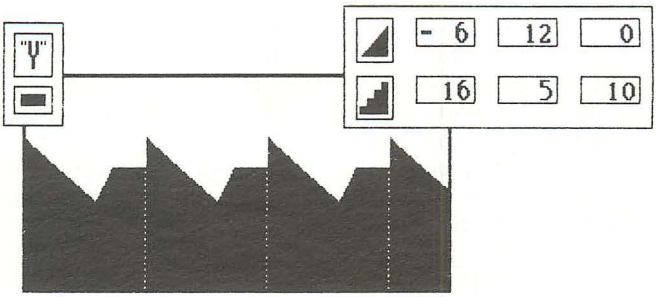


Changing the pitch up and down rapidly produces a vibrato effect. This can be slowed down by increasing the step time. A slow change in pitch gives a glissando effect. If you want the note to stay in tune make sure that the upward change in say DRE section 1 is the same as the downward change in DRE section 2. You could of course have more complicated pitch patterns involving a third DRE section. Pitch changes are especially effective in percussive effects using the noise waveform.

A phasing effect used to great effect by synthesiser players is achieved by sweeping the pulse width. The step time can be used to slow down or speed up the effect. Both the pitch and the pulse width can be swept together using the same DRE sections.



The repeat device can be either on or off. When off each DRE section will only be active once. When on the whole sequence of DRE sections will be repeated continuously until the end of note duration. DREs are not active during the release phase. Only DRE sections which have non-zero step lengths will be included in the sequence. Patterns consisting of 1, 2 or 3 frequency sections can be repeated. The initial pitch or pulse width value is reset at the beginning of each cycle. If the volume reaches zero before the sequence is completed then the repeat device will have no effect.



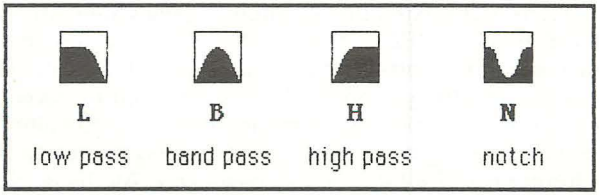
DRE section repeats until end of note duration.....

Filters

Filters can alter the tone of a note by allowing only a certain range of frequencies to pass through. TMS allows you to define 4 filters to be used with the set of 15 envelopes. However, the CBM64 sound hardware only lets you use one filter for all three voices. You may set the filter number off, or select one of the four filters available. The filter number device displays the current filter that can be used by the sequencer.

A filter is defined in a similar way to an envelope. There are three main parameters: filter type, resonance and filter frequency. A DRE may be used to sweep the frequency. The filter devices are popped up by pressing **F** or accessing Commands: *Filter up*. They are then included in the normal circuit. These devices are popped down in the same way.

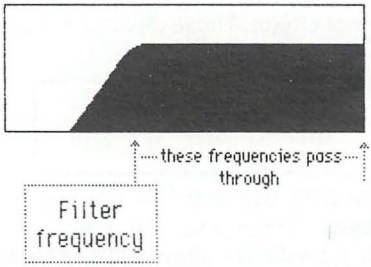
The filter frequency DRE can only be popped up when the filter devices are displayed. Otherwise the pitch/pulse width DRE is displayed. The filter type device allows you to select one of the four available filter types. They are identified by an icon and a letter.



The low pass filter allows everything below a certain frequency to pass through, cutting out most of the higher frequency sound. This means that high pitched notes might sound very quiet if heard at all! The high pass filter works in the opposite way. The band pass filter restricts the frequency range to near the filter frequency. The volume and sound of a note passing through a band pass filter depends a great deal on how far the pitch of the note is away from the filter frequency. The notch filter is opposite to the band pass.

The filter resonance determines how effective the filter will be. With a low resonance the filter effects might not be very marked, however with a high resonance the effect will be more noticeable.

The filter frequency graph gives an indication of the effect of the particular filter. The black area of the graph shows which frequencies will pass through unaffected. Move the graph using **Q** and **W** in the normal way.



The filter frequency can be modulated with the filter DRE. Press **D** to pop it up. Note that it will appear automatically when you press **F** if the pitch/pulse width DRE is already displayed. Sweeping the filter frequency can produce amazing sounds such as the 'wahwah' effect loved by many electric guitarists. This is achieved by sweeping the frequency of the band pass filter up and down. You can alter the rate using the step time device. 'Flanging' is achieved by slowly changing the filter frequency of a high or low pass filter. All these effects are

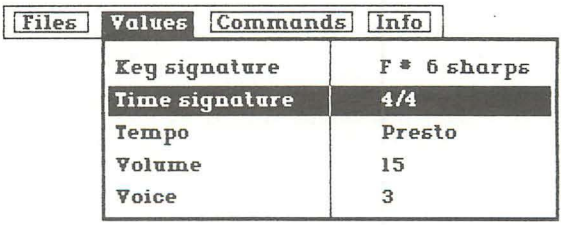
based upon triangle, saw or pulse waveforms. However the noise waveform (white noise) can be filtered to give what is known as pink noise. Sweeping the filter frequency can produce dramatic sounds.

The Command Line

Apart from the normal filing operations and status information, the Command line is used to access the many commands available from within the SYNTHESISER. These are described below.

Files f1

TMS stores two sound sets in memory. Only the envelopes and filters in sound set 1 are immediately available for use within the modules. The SYNTHESISER always displays this set. The second set can be swapped in at any time by accessing Commands: *Swap sound sets*. Individual envelopes or files may also be swapped or copied between the sets. Sound sets can be loaded into either set 1 or set 2. When loading remember to press ← to switch between set 1 and 2 (see 'Filing'). Similarly for saving sets.

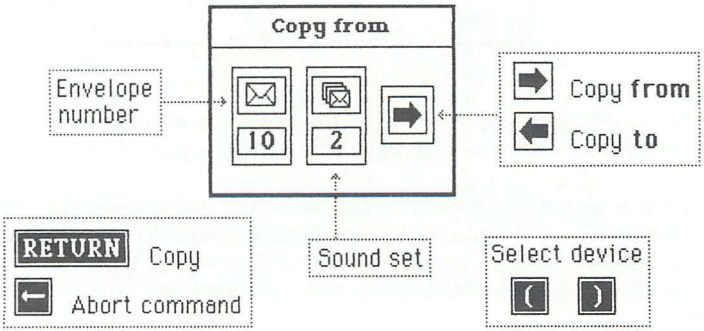


The *Key signature* and *Time signature* can not be changed in the SYNTHESISER. They are displayed for reference purposes only.

Tempo and *Volume* can be changed while you are playing a tune in the sequencer. To change the octave settings for each voice, highlight *Voice* and press **RETURN**. The *Octave* for that voice can then be changed. Press **RETURN** to pop the secondary window down again.

Commands f5

DRE up (down) displays or hides the Dynamic Response Envelope. This is equivalent to pressing **D**. If the filter devices are displayed the filter frequency DRE will pop up. *Filter up (down)* pops the filter devices up or down. This is equivalent to pressing **F**.
Copy envelope allows you to copy the current envelope parameters (which are always in sound set 1) **to** any other envelope in either sound set 1 or sound set 2. You may also use this command to copy the parameters **from** any other envelope to the current envelope. A pop up appears under the Command line. Move between the devices with [and], changing the values with **Q** and **W**. Press **RETURN** to copy. You may escape from this command by pressing ←.



Use *Copy filter* in exactly the same way to copy filter parameters. The copy operations are very useful for making up a new sound set from envelopes and filters in other sets. The easiest method is to *Zero all envs* and *Swap sound sets* to get a 'blank' set in sound set 2. Then load your sound sets into set 1 and copy the required envelopes from each one to the new set in 2. Remember that you have to be on the required envelope number (use **Z** and **X** to change) before accessing *Copy envelope.* Use a similar procedure for making up a filter set.

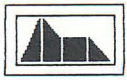
Swap envelope and *Swap filter* and very similar to the copy commands except that there are only two devices in the pop up for specifying the envelope or filter to be swapped with. Again you may abort the command by pressing ← .

Zero envelope and *Zero filter* can be used to reset the current envelope/filter to a standard set of parameters. These may be used as a base for creating a new envelope or filter. *Zero all envs* and *Zero all filters* reset all the envelopes/filters in sound set 1 to the same standard values. All envelope/filters will then be identical. This is particularly useful when starting to create new sounds from scratch.

Reset envelopes resets all the envelopes in sound set 1 to the default values that were initially loaded into set 1 when entering TMS. *Reset filters* replaces the current set of filters with the original default set. After the *reset* commands the envelopes/filters will all be different unlike the *zero* commands above.

Swap sound sets swaps set 1 completely with set 2. If you want to hear and edit the alternative sound set (2) you have to first swap it into set 1. After editing you can always swap back in the original sound set 1. If you want to try a new set of envelopes and filters with a particular tune using the sequencer swap sound sets before loading the music file (the sound set associated with the music file always loads into set 1). Then swap your new sound set back into set 1 to use with the tune. This avoids having to reload the sound set again.

Exit synthesiser will exit back to the Control screen as will **COMM-HOME.**

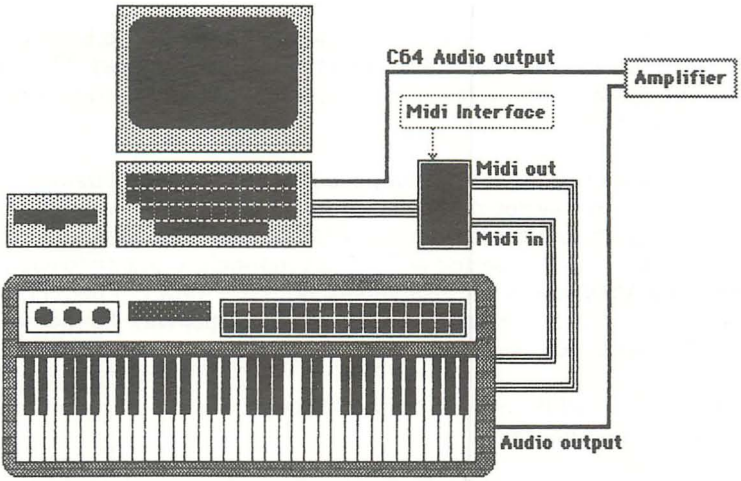


Info f7

The normal music file information is displayed. Use info to see which sound set you are currently using.

MIDI

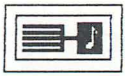
The Midi module provides a software interface between the Music System and an external midi keyboard/synthesizer. This module requires that a MIDI keyboard is connected to your Commodore 64 microcomputer via a hardware MIDI interface. AMS is configured to function correctly with most MIDI keyboard/synthesizers in conjunction with either the S.I.E.L. MIDI computer interface (UK, or the PASSPORT DESIGNS C64 MIDI INTERFACE (USA). Other MIDI hardware combinations (ie J.M.S.) may also work, but Island Logic cannot guarantee this. You may also find it desirable to provide some form of amplification for your keyboard.



Midi hardware combinations can send and receive MIDI format data files from the Commodore 64. The AMS MIDI module can record and playback MIDI standard files with a limit of six voices or channels. The module will allow a single keyboard to be directly interfaced with AMS. For more complex operations consult your MIDI hardware manual.

WARNING During any sort of disk drive operation it is advisable to remove the lead from the 'MIDI IN' socket of the interface. This is because some keyboards could interrupt such operations and possibly crash the system. The 'MIDI IN' lead should only be connected during MIDI RECORD and PRACTICE operations.

IMPORTANT



The MIDI module does not have explicit channel assignment. The playing back of a track is through the same channel as it was recorded. When recording a track you must set the MIDI output channel on the keyboard to the one you want it to be played back on. AMS will do its best to be compatible with as many keyboards as possible. Unfortunately hardly a day goes by without news of some new MIDI facility or device. The only way to uncover the power of MIDI is to experiment. AMS offers you lots of flexibility - you can tidy up MIDI music files in the EDITOR module - or re-assign the sound envelopes to be played via your MIDI keyboard.

All recording and playback is from the start of a track. To add to the end of a track you must use a separate track and use the EDITOR to 'cut and paste' the two tracks together via a 'notepad' file. The EDITOR contains many facilities to help you tidy up or correct your compositions.

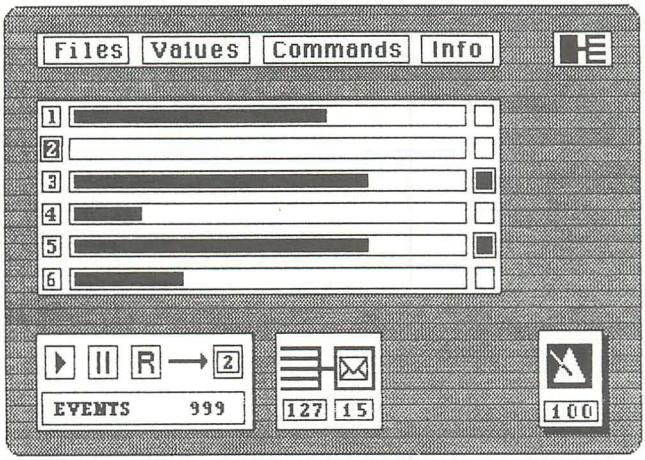
To EDIT or PRINT any music composed via MIDI, the MIDI data file (X. file) must be converted into one or more internal TMS music files (m. files). To do this AMS provides a TRACK/VOICE ASSIGNMENT device that will allow you to decide which MIDI channels to assign to each of the three AMS voices (or visa versa). Both the MIDI (x.) file and the AMS (m.) file/s can be saved to disk in the normal way via the FILES COMMAND LINE option.

The METRONOME tick is output through the Commodore 64's internal sound hardware.

An audio output from the C64 can be obtained from pin 3 of the Audio connector (N.B. Consult your Commodore 64 user manual before attempting any hardware modifications).

PLAYING MIDI

The MIDI module can be selected from the CONTROL SCREEN By highlighting the MIDI ICON (SPACE bar) and pressing **RETURN**. The initial MIDI screen shows the MIDI TRACK device in the center of the screen just below the COMMAND LINE. Other devices occupying the same screen are the METRONOME (bottom right), the ENVELOPE device, (bottom middle), and the RECORD/PLAYBACK/EVENT device (bottom left). You can EXIT back to the CONTROL SCREEN by selecting *EXIT MIDI* via the COMMANDS pop-up or by pressing the **COM CLR/HOME** key pair.



The VOICE MONITOR WINDOW (VMW) can be displayed by pressing the **COM V** key pair or selecting it from the COMMANDS pop-up (**F5**). The VMW is closed on pressing the same **COM V** key pair. The VMW will display and animate music contained within the current voice in a similar way to the KEYBOARD module. The current track (available for recording) is indicated in the EVENT/RECORD/PLAYBACK device, in the VALUES pop-up and on the MIDI TRACK METER device.

The VMW will display music in real time as it is entered from a MIDI keyboard. The VMW will also display music being played back through a MIDI keyboard.

PRACTICE MODE. Pressing the **COM P** key pair will put MIDI into PRACTICE mode. The VMW will pop-up and display any music played

through a MIDI keyboard. Music is not saved. **RUN/STOP** exits practice mode.

The COMMAND LINE (MIDI)

Most MIDI operations can be controlled via the COMMAND LINE. Unlike the other modules AMS music (m.) files cannot be loaded directly into the MIDI module. Instead AMS voices are converted and assigned to MIDI tracks as the AMS music (m.) file is loaded. You can load and assign more than one AMS music (m.) file into a single six track MIDI (x.) file. This feature allows you to pick and mix AMS voices from different music files for use by MIDI.

The reverse is also true. You must assign MIDI tracks to specific AMS music file voices if you wish to save music composed via MIDI in AMS (m.) format.

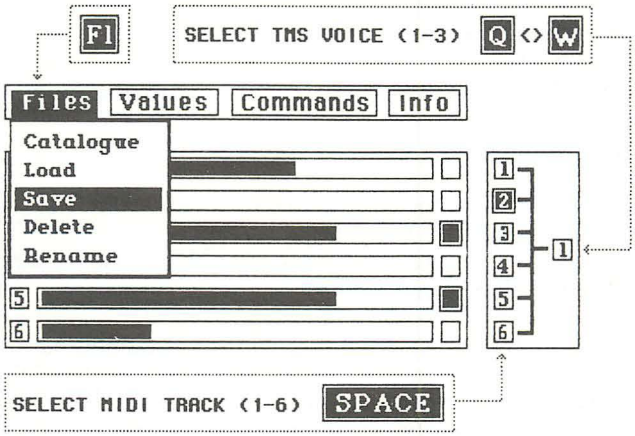
You can of course save and load MIDI (x.) format music files directly in and out of the MIDI module. However MIDI (x.) files cannot be used directly by the rest of the system. A MIDI (x.) file created by an external keyboard will retain any special effects ie. modulation etc. If the music data is saved as a AMS music (m.) file, then these effects will be lost.

To edit or print MIDI music you must convert it to AMS format by opting to save the music as a AMS (m.) file. This can be done easily from the COMMAND line. Select the SAVE option from the FILES pop-up and press **RETURN**. A small SAVE MUSIC pop-up will then appear. You can use the ← key to change between SAVE MUSIC and SAVE MIDI. If you decide to save the music in AMS format, select SAVE MUSIC and type the name you wish to give the tune (file name). Note that filenames m.music and x.midi are displayed as default names. Press **RETURN** to activate the SAVE operation. A confirm pop-up will then await a **Y** or **N** response. Answer **Y** to confirm the SAVE operation, or N to abort the SAVE operation.

Use the arrow key to flip between file types.

TRACK/VOICE ASSIGNMENT

At this point a special TRACK/VOICE assignment pop-up appears to the right of the MIDI TRACK METER. You can use this device to tell the filing system which MIDI tracks to assign to which AMS voices. Use the **Q** and **W** keys to change the AMS voice and the **SPACE** bar to assign the MIDI track. (see diagram below). Note that the AMS voices 1 - 3 have MIDI tracks 1 - 3 assigned as default values.



If your MIDI composition uses more than three tracks you can SAVE say three of these into one AMS (m.) file and then repeat the SAVE operation to save the other tracks into a second or even third AMS (m.) file. Press **RETURN** after you have assigned the tracks to create and save the AMS (m.) file. If you create more than one AMS file from a MIDI file try and choose file names that relate to one another. This will make life easier when reassigning these AMS files to a MIDI file.

eg. m.PART 1 m.PART 2 m.PART3 etc.

Loading files into the MIDI module works in a similar way. You may load multiple AMS (m.) files one at a time into MIDI tracks again using the TRACK/VOICE assignment device. Since MIDI uses 2 to 3 times more space to store music data than internal AMS (m.) files care must be taken during multiple file loading to ensure that you have the space available. The FILES command line pop-up can also be used to produce a CATALOGUE of your data disk. It can be used to DELETE or RENAME a file. Refer to the COMMAND LINE section of this manual for more information.

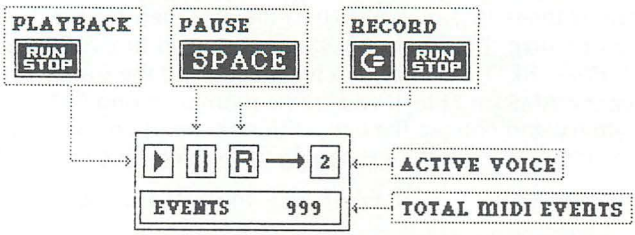
MAKING MUSIC

The easy way to check that your MIDI set-up is working is to load a MIDI (x.) file directly into the module and experiment with the various ways of playing the tune back through a connected external MIDI keyboard.

1. Load the MIDI module from the CONTROL SCREEN.
2. Press **F1** to display the FILES pop-up.
3. Use the **SPACE** bar to select the LOAD option.
4. Press **RETURN**.
5. Use **SPACE** to select x.example from the catalogue.
6. Press **RETURN**.
7. Press **Y** to confirm the LOAD operation.

You will see that when the file has loaded the horizontal bars on the MIDI TRACK METER will partially fill indicating that those TRACKS contain music data. To play the music through an external keyboard press the **RUN STOP** key.

If your MIDI keyboard is correctly set up then you should hear the music play. Stop the music playing by pressing the **RUN STOP** key again. The **SPACE** bar can be used to pause the playback at any time. Press **SPACE** to release the pause mode and continue playing.

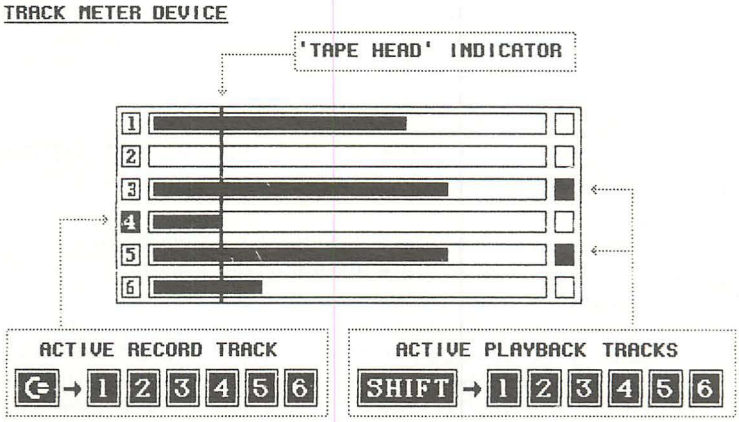


It is important to note that unlike the EDITOR and KEYBOARD modules, the MIDI module does not have its own internal sound driver, so cannot produce sound without an external MIDI keyboard.

The EVENT indicator in the RECORD/PLAYBACK/EVENT device shows the number of MIDI EVENTS used. During recording you must take care that this number doesn't exceed 3000. If this happens then you could be running on empty.

The MIDI TRACK device

The MIDI module's flexibility relies on the ability to display individual voices during RECORD and PLAYBACK operations as animated music within the VMW (Voice Monitor Window). The VMW is always associated with the midi track selected for recording. i.e. The ACTIVE RECORD TRACK.



The ACTIVE RECORD TRACK is the midi track which is selected for recording on to. This can be changed by holding down the Commodore key and pressing a number key between **1** and **6**.

For playback operations you may elect to play back one or more of the tracks. The tracks active for playback can be toggled ON or OFF by holding down the **SHIFT** key and pressing a number key between 1 and 6.

The 'Tape Head' indicator provides a visual guide across tracks during record operations. Note that the TRACK METER highlight bars re-scale themselves when they reach the left side of the device providing an accurate visual indication of the size of each track.

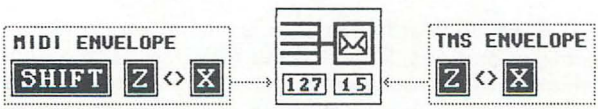
RECORDING is started by pressing the **COM RUN-STOP** key pair and stopped with the same keys. You can pause recording with the **SPACE** bar.

ENVELOPES

In order to fully understand the MIDI module it is recommended that you experiment with other AMS modules. The EDITOR, KEYBOARD and SYNTHESISER all use ENVELOPES to describe different instrument sounds. These instrument sounds can be changed within each of the modules to provide an unlimited range of sounds. The above modules can store 30 of these sounds (or ENVELOPES) for use within EDITOR or KEYBOARD compositions. New sets of envelopes can be loaded into the modules via the FILES (LOAD) command line pop-up in the form of two sound files (refer to the COMMAND LINE section of the manual). Each sound (s.) file contains 15 envelopes or sounds.
These sounds are created edited and saved from the SYNTHESISER module. They use the internal Commodore sound hardware.

When a MIDI file is created the external MIDI envelope numbers as used by your MIDI keyboard are automatically assigned to internal AMS ENVELOPE numbers 1-15 as they occur. Since some MIDI keyboards are able to use up to 255 different envelopes, you must ensure that the AMS envelope numbers to which the MIDI envelopes are assigned simulate the sound of the MIDI envelope. This may require that you use the SYNTHESISER to edit the ENVELOPE file so that when the MIDI (x.) music file is converted and saved to a AMS music (m.) file are played back through the EDITOR, the sound is roughly equivalent to the original MIDI input.

When a AMS (m.) file is loaded/converted back into MIDI the original MIDI envelopes are re-installed so that on playback through the MIDI keyboard, the correct sounds are played.
During a MIDI recording session you may change the MIDI envelope from the MIDI keyboard as often as you like. However if you use more than 15 different envelopes the automatic envelope assignment will overflow into AMS envelope number 15.



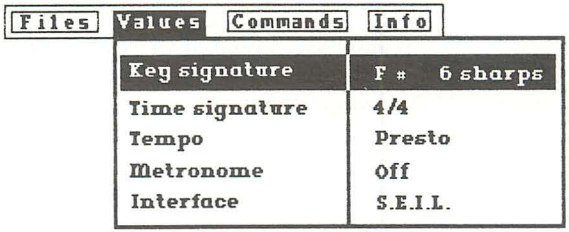
You can manually change this assignment of MIDI envelopes to AMS envelope numbers via the ENVELOPE ASSIGNMENT device. Use the **Z** and **X** keys to view how these envelopes are assigned. Use **SHIFT Z** and **SHIFT X** to change the MIDI envelope assignment.

VALUES (F3)

The **Q** and **W** keys can be used to increment or decrement any selected value within the VALUES pop-up.

The TIME SIGNATURE and TEMPO can also be toggled to display their alternative notations using the ← key. Note that TIME SIGNATURE can only be changed while there is no music in the system. This sets the time signature for any new music data entry.

INTERFACE allows you to select the MIDI hardware interface being used to connect the Commodore 64 and an external midi keyboard.



COMMANDS (F5)

The currently highlighted COMMAND can be activated by pressing the **RETURN** key.

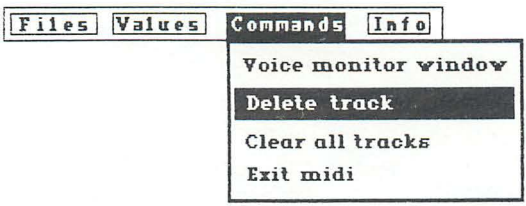
DELETE TRACK will delete the current active MIDI track as set within the VALUES pop-up. You may use the **COM 2** to **6** key pairs to change the ACTIVE RECORD TRACK.

CLEAR ALL TRACKS will delete all tracks.

METRONOME will toggle the metronome tick on or off. The **N** key will also toggle the metronome tick. The sound of the metronome tick is generated internally and played through the Commodore 64's internal sound system. If you have provided an external sound output for your Commodore then this metronome tick can be amplified separately to your MIDI keyboard output.

The VOICE MONITOR WINDOW command will toggle on and off screen the VMW. The **COM V** key pair also toggles the VMW on and off. The VMW can only display the ACTIVE VOICE. Use **SHIFT RUN-STOP** to play the ACTIVE VOICE through the VMW.

EXIT MIDI will exit back to the CONTROL SCREEN as will the **COMMODORE CLR-HOME** key pair.

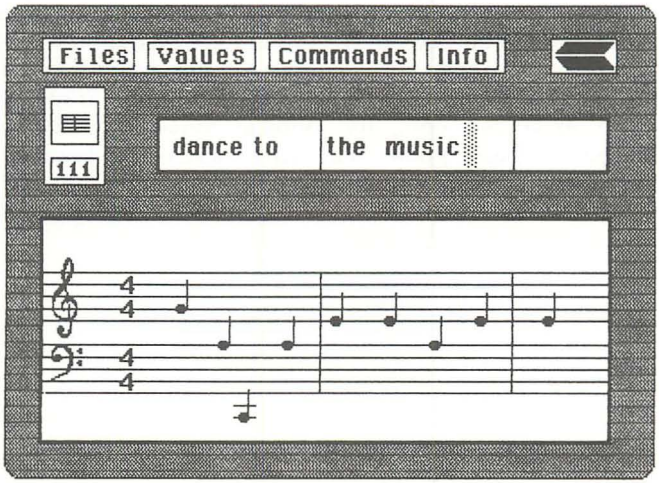


INFO (F7)

This pop-up window displays the number of EVENTS in each of the six MIDI tracks, as well as the amount of free space left to the user.

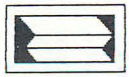
The PRINTER Module

The PRINTER module allows the printing of AMS music (m.) files in various prints qualities on standard form feed paper. Both the Commodore and Epson range of printers are supported. Many Epson compatible printers will also work. Music is printed out in horizontal format, 1 - 3 voices. Lyrics can be entered or loaded from disk to be included with the print-out.



The PRINTER screen operates in a similar way to the rest of the system. Important functions are provided via the COMMAND LINE. The PRINTER screen also displays a fixed VMW (Voice Monitor Window) together with a TEXT window. The Printer VMW will only display Voice 1. Text or lyrics can be entered and saved as a TEXT (t.) file. Music can be printed with or without lyrics.

On entry to the module, if no music is present, then only the COMMAND LINE is active. Music files may be loaded by using the Files **f1** pop-up. If a music file (m.) is loaded, any text (t.) file with the same name will be loaded at the same time. The text is displayed within the text window along with the music. If a text file with the same name is not available then the text window will remain blank ready for text input. Barlines are shown on the text window corresponding to the positions of the barlines in the music.

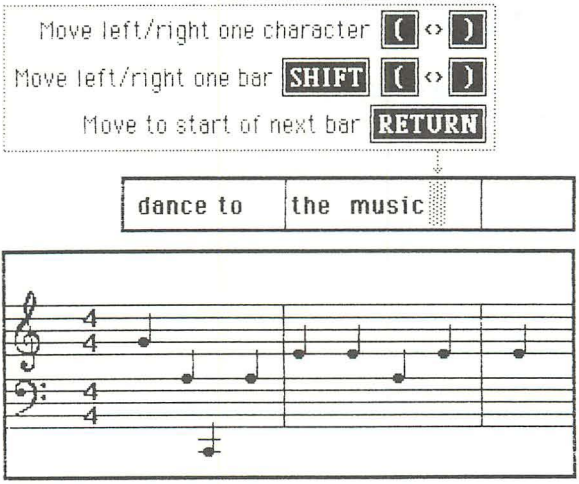


The VMW (Voice Monitor Window) displays voice 1 of the music file, in exactly the same format as it will appear when printed out (i.e. including any spaces necessary to align with the bars in voices 2 and 3). The white marker in the text window indicates the position of the text cursor. Barlines in both the VMW and the TEXT window are aligned and scroll synchronously.

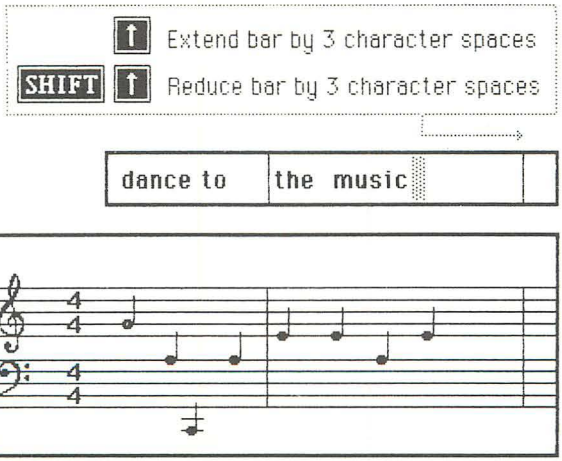
Text can be entered via the TEXT window and edited easily via simple line editing commands. Editing always occurs within the current bar as indicated by the bar icon to the left of the TEXT window. During editing the bar width may be expanded to fit the text. This effect only occurs within the PRINTER module. Even though the printed music may have expanded bars, the original music (m.) file is left undisturbed. If the text is deleted then the music can be printed out in the normal way.

Editing Lyrics

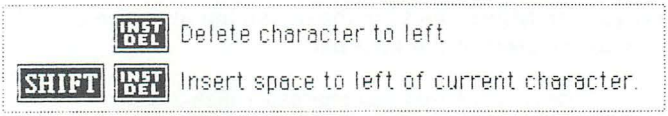
You can type lyrics in both upper and lower case, directly into the text window. The white text cursor can be moved back and forth via the [and] keys. Use **SHIFT** [and] to move one bar at a time and RETURN to move to the start of the next bar.



Text often requires more space than the bar width of the music allows. The bar width can be extended or reduced using the SHIFT and up arrow keys as described in the following diagram.



Characters may be deleted using the **INST DEL** key. Extra spaces may be inserted using **SHIFT INST DEL.**



Note that the total bar width is not increased when you insert spaces in this way: the text in the current bar is simply moved over to the right, and if there is not room in the bar it will be truncated! Use the up arrow key (described above) if you need to actually extend the bar width.

THE COMMAND LINE (PRINTER)

The operation of the command line is much the same as the other AMS modules. Refer to the section earlier in this manual for a full description of the command line.

FILES f1

LOAD Both music (m.) and text (t.) files may be loaded into the PRINTER module. When a music file is loaded, its corresponding text file will also be loaded, automatically, if it exists on the disk. A text file cannot be loaded if no music file is present. Use the ← key to switch between (m.) and (t.) file types.

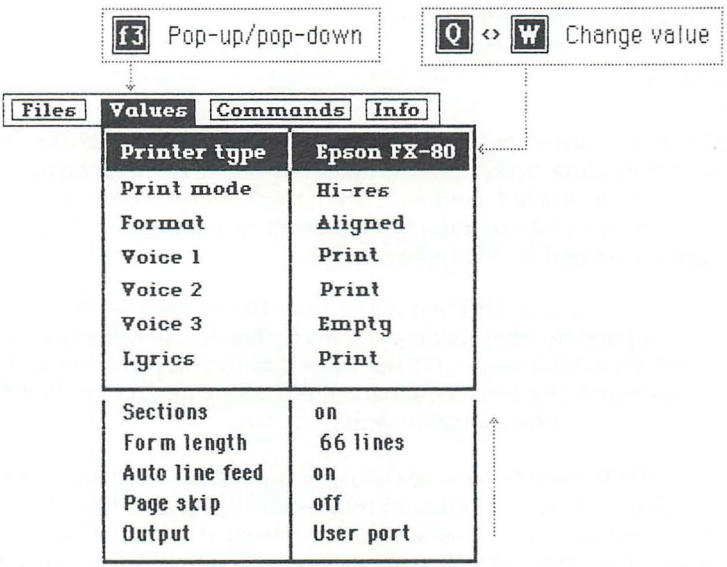
If the text file has a different name from the music file, it must be loaded separately after loading the music file. If a text file is loaded which does not correspond to the current music file, an effort will be made to match the text to the bars. If the text is too long to fit a bar then the text will be truncated within the bar.

The PRINTER module does not allow music files which contain more than 255 bars in voice 1. An error message will pop-up if this situation occurs. You can avoid this situation by using the EDITOR to create smaller files. The LINKER can be used to create larger files for playback.

SAVE. Only text (t.) files (lyrics) can be saved from this module. No music editing facilities are provided within this module. Try and make sure you give the text (t.) file the same name as the music (m.) file for subsequent auto-loading. You may create more than one Lyric TEXT file for the same piece of music. To do this, use a similar (but unique) name for the text (t.) file.

CATALOGUE, RENAME and DELETE are also available from the FILES Command Line as usual.

VALUES f3

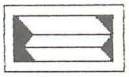


Printer type. The first item in the values window allows printer selection. Five different printers are cated for: use the Q<>W keys to select.

Printer	HI/LO Res	Auto Line Feed	Page Skip
Epson FX-80	Yes	Yes	Yes
Epson RX-80	Yes	Yes	Yes
*Epson MX-80 F/T	No	Yes	Yes
Star Delta 10	Yes	Yes	Yes
CBM MPS 801	No	No	Yes
CBM MPS 802	No	No	Yes

*For the Epson MX-80 F/T select Epson RX-80.

Although other dot matrix printers may work, Island Logic can only guarantee that AMS will operate correctly if used with the above printers.



Print mode. This allows you to select either High or Low print resolution. N.B. Some printers do not support different resolutions.

Format. The music may be printed either with the bars in each voice *aligned,* or *non-aligned* N.B. Text (lyrics) can only be printed if the bars are aligned.

Voices. These entries allow the selection of voices for printing. If a voice is empty it cannot be printed. Text can only be printed when all non-empty voices are selected for printing.

Lyrics. These may be printed or not, subject to the conditions specified in Voices and Format.

The following values can be found by scrolling the VALUES menu up. ie. Move the highlight bar to bottom of window to begin scrolling.

Sections. If set to *Off* then all section markers will be ignored. If set to *On* and if a voice has a section marked, then the section will be printed once and the printing of that voice terminated.

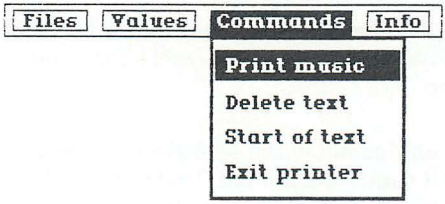
Form length. Can be set for either 66 or 72 lines per page.

Auto line feed. Some printers may generate their own line feeds: if so, this entry should be set to *Off.* Set this entry to on if line feeds are required.

Page skip. When set to *On* the music will be printed on separate pages, otherwise it will print continuously.

Output. Two methods of connecting a printer to your Commodore 64 are supported: either via the *User port* or via the *Serial port* using a serial to parallel converter (interface).

COMMANDS f5



Print music. This command starts the printing of music. All values should already have been set up. Use the RUN/STOP key to abort printing.

Delete text. This will clear all the lyrics from the text memory, and clear the text window.

Start of text. Reset text cursor to start of text.

Exit printer. Exit the module back to the Control Screen. Note that all text will be lost from memory, so remember to save it to disc before leaving the Printer module if you wish to keep it. Any music file present will remain in memory, however.

INFO f7

Display only. Indicates current status, as in other modules, except that the Free Space here indicates how many text characters are still available. This number will change only if you expand or reduce bar widths.

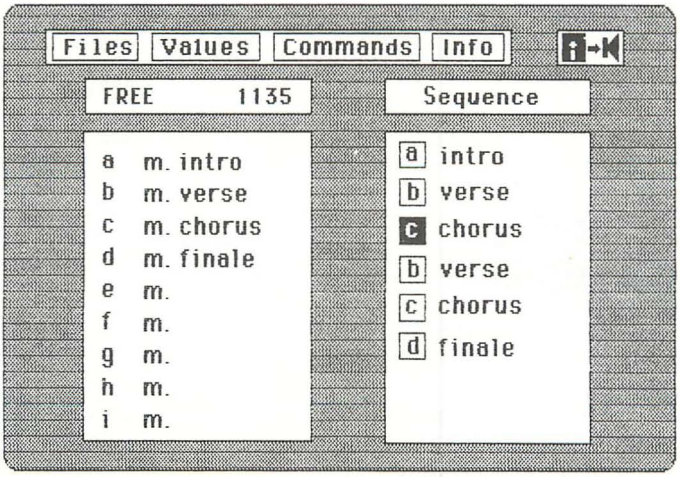
LINKER

The LINKER module enables large compositions consisting of up to 26 separate music files to be played back as one piece of music. In this way tempo, key and time signature changes can be easily incorported into a composition. The music files can be created in the EDITOR, KEYBOARD or MIDI modules. Each of the separate files are played back exactly as they were composed; at the specified key and tempo with the envelopes and filters in use at the time. The sequence in which the files are played back can easily be entered and edited. The separate music file can be saved as one large or LINKER file together with the sequence. This can be reloaded for playing or editing.

There is space for over four maximum-sized music files in the LINKER. However, since compositions are often made up of shorter sections in perhaps different key and time signatures there is room available for 26 different music files at one time.

Unlike the EDITOR or KEYBOARD modules for instance, the Linker will not play any music until you have loaded a music or Linker file. Any music and sound sets in memory are wiped out when you enter the LINKER module. Make sure that your latest masterpiece has been saved on disc *before* selecting the LINKER!

The LINKER screen

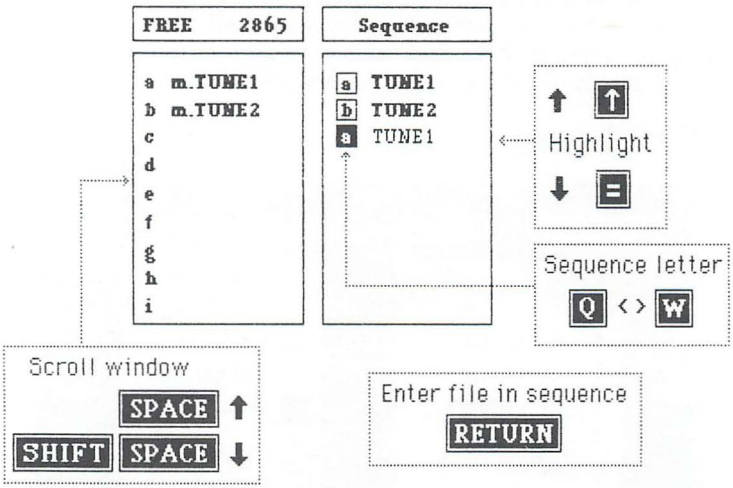


The LINKER module can be selected from the CONTROL screen by highlighting the LINKER icon and pressing **RETURN**. The screen consists of two windows; the file list on the left and the sequence on the right.

The file list displays any music files that have been loaded either as individual music files or together as part of a LINKER file. The music files are labelled from *a.....z*. These letters are used to identify the music files in the sequence. When files are loaded they are automatically entered in the first available space in the list. They are then available for use in the sequence. There are Commands for replacing and deleting music files in the list.

The sequence window displays the order in which to play the individual music files. Only music files that appear in the file list can be included in the sequence. Files may be repeated as many times as you want in the sequence. However there is a maximum of 99 items in any sequence! The sequence can be played from any point.

Entering and playing a sequence

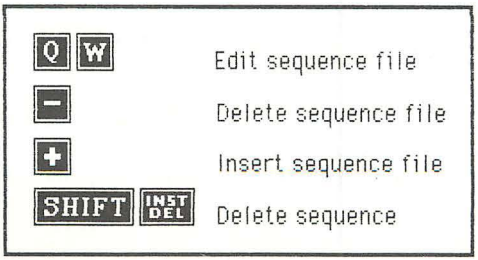


Load a music file using Filing in the usual way. You can also load a linker file...but we'll get to that later on. The music file should have appeared in the file list as file *a*. Load another music file. This will appear as file *b*. underneath. You can scroll the file list in the window with **SPACE** and **SHIFT-SPACE**. This is only necessary when you have too many files to fit in the window.

As you load music files keep an eye on the Free space displayed above the file window. You will be warned if a music file is too big to load. Having loaded a couple of music files you can enter these in the sequence window. Use **Q** and **W** to move through the file letters (in this case only *a* and *b* will appear) and press **RETURN** to enter the file in the sequence. The highlight will move on to the next null entry shown in blue ready for selecting and entering if necessary. Choose the other file and press **RETURN**. You should now have two files entered in the sequence and a null entry at the end. Press ↑ (twice) to move to the top of the sequence and press **RUN/STOP** to play. If you have a long sequence use **SHIFT**-↑ to move to the top. You can stop the sequence by pressing **RUN/STOP** again.

The music will play from the highlighted file in the sequence and will continue to the final item. Remember that you can kill the sound when the music has ended by pressing ← . You can not play from the null entry at the bottom of the sequence.

Files may be deleted from the null entry at the bottom of the sequence with - and inserted in the middle of the sequence with +. You can delete the entire sequence by pressing **SHIFT-DEL**.



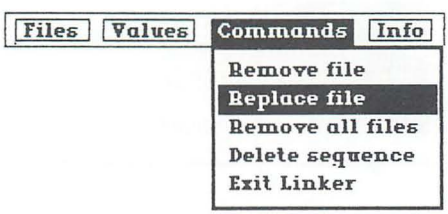
Linker files

Having loaded a set of music files and entered the sequence you may like to save the entire composition as one file ready to be loaded again for the next performance! The *Save* option in Filing allows the music to be saved as a linker file. Make sure that you have plenty of room on your library disc as linker files can be quite large.
You can use the *Load* option to reload your linker file. All the original music files and the sequence will be loaded *overwriting any files that have already been loaded*. Make sure that you do not load a linker file instead of a music file by mistake!

The Command Line

Apart from the Filing operations mentioned above, the Command line is used to access the status information of each music file and a number of Commands. There are no accessible parameters within Values.

Commands f5



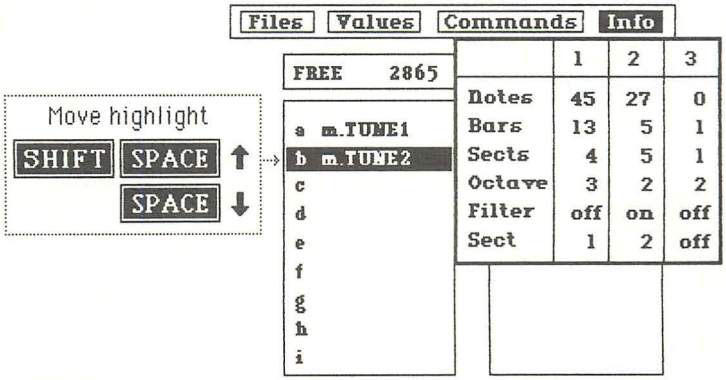
Remove file is used to delete a music file from the file list. After accessing the command (press **RETURN**) one of the music files is shown highlighted. Move the highlight to the required file using **SPACE** and **SHIFT-SPACE** and press **RETURN** to remove the file from the list. You are not allowed to delete a file that is in the current sequence. If you decide that you didn't really want to delete any of the files, find a blank entry and press **RETURN**.

Replace file is used in exactly the same way except that you enter the Filing option after selecting the file to replace and pressing **RETURN**. Now load the replacement file. Note that music files can be loaded in any order.

Remove all files deletes all music files in the file list and *Delete sequence* has the same action as **SHIFT-DEL.**

Exit Linker will exit back to the control screen as will **COMM-HOME.**

Info f7



The status information can be displayed for any music file in the list. Move the highlight bar up or down to show the information for other files. Press **RETURN** or **f7** to pop Info down again.

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APPENDIX

On the reverse side of your disc is a utility to convert TMS files saved on cassette to disc AMS files.
To load this utility, type
LOAD "FILES",8,1 <RETURN>
The program will then load and run automatically.

Press the f1 key on the Commodore to load a file from tape - the familiar TMS "Files" window will pop-up, and you may select either the Catalogue or the Load option to load a file, as in the tape version of TMS. (In this case the Save option will do nothing.)
When a file is loaded, simply press Y to confirm that you wish to save it to disc. When the file has been saved to disc, you may then load another file from tape and repeat the process.

N.B. This utility does not contain any disc filing facilities: if you wish to Catalogue your disc, Rename files etc., this can be done from within any Advanced AMS module.

On your AMS disc are some sample music and sound files. These are provided as examples of what AMS can do.

The Music

1	Breaker	A hip hop special from Mark Harrison.
2	Minuette	- Beethoven rolls over - courtesy of Tony Selinger
3	Fugue	- Bach arranged by Nicky Johns.
4	Rag	- A Scott Joplin tune.

The Soundsets

Electro pop (included with Breaker)

1 Hihat
2 Accent
3 Snare
4 Bassdrum
5 Scratch
6 Syndrum
7 Electro bass
8 Lead 2
9 Worp
10 Lead 1
11 Attack
12 Burble
13 Lead 3
14 Lead 4
15 Tremelo

Orchestral (included with Minuette)

1 Violin 1
2 Violin 2
3 Cello
4 Doublebass
5 Clarinet
6 Oboe
7 Bassoon
8 Flute
9 Saxophone
10 Trumpet
11 Trombone
12 Piano
13 Harpsichord
14 Harp
15 Percussion

Also included with the soundsets are some sample filter settings. These will enhance the sound of the envelopes provided.

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